

**SELECTIONS FROM THE RECORDS OF THE BOMBAY
GOVERNMENT IN THE POLICE BRANCH.**

No. I.—NEW SERIES.

REPORTS AND RETURNS

RELATING TO THE CRIMES OF

THUGGEE AND DACOITY;

CORRESPONDENCE RELATING TO ACT No. XXIX. OF 1850

PAPERS ON THE SUBJECT OF CONFESSIONS;

WITH

REPORTS ON AND LIST OF WANDERING TRIBES.

COMPILED AND EDITED

BY

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THUGGEE AND DACOITY.

No. 8 of 1854.

From J. D. INVERARITY, Esq.,
Political Agent, Southern Muratha Country,
To C. J. ERSKINE, Esq.,
Acting Secretary to Government, Bombay.

Dated 11th January 1854.

SIR,—I have the honour to acknowledge the receipt of your letter No. 69, dated 6th instant, in the 7th and 8th paragraphs of which is required the expression of my views on the point whether the whole tribe of Kaikarees, being apparently amenable to the charge of being professional Dacoits, &c., it would not suffice, when the evidence consists exclusively of the narratives of approvers, to bring to trial the most notorious amongst them, such as Naiks, leaders of gangs, and those who have been implicated in dacoities of an aggravated character.

2. In reply, I beg to state that, from the evidence adduced before me in late Dacoit trials, I gather that dacoity is emphatically a profession, though not necessarily a hereditary one;* that its active duties are entered on at the age of sixteen; and that though agriculture, mat-making, snake-charming, conjuring, and similar callings, are ostensibly employments of these professionals, their real source of subsistence is plunder. Burria Naik,† an old Dacoit, affirms that he has committed “robberies without number—four or five every month, since he was sixteen years of age.” Dod Sahibya,‡ a famed Dacoit, affirms,—“But as for the burglaries he has committed, they are as numerous as the hairs of his head.” Kullolia Naik§ affirms that he “has committed, with

* Nagia, approver No. 1 in proceedings submitted with my letter No. 167, dated 27th July 1853, states: “His ancestors were not Dacoits; he himself entered on the profession.”

† No. 2 of proceedings submitted with letter No. 151, dated 9th July 1853.

‡ No. 1 of proceedings submitted with letter No. 183, dated 22nd August 1853.

§ No. 5 of same proceedings.

his father, and independently of him, about five hundred burglaries." "Burglaries," he adds, "are committed in the dark nights. If there be obtained a good booty, a monthly burglary contented them; if not, burglary was their nightly occupation during the dark nights."

3. I further gather, that Jail discipline is ineffective in weaning men from this profession. Kurce Sahibya, approver* (who was not a Naik), affirms that he "was with three others, at a former time, punished for a robbery at Yekoondec, with three years' imprisonment. On release from Jail, reverted to his old calling of dacoity and robbery." Hoolgia, approver,† affirms: "Was in Jail for five years, on conviction for a robbery at Hunnunhullee. Geerya was engaged with him, but escaped conviction. Tooljia was convicted, though not engaged in the robbery. After release, they reverted to their profession of robbery and dacoity."

4. The organisation of Kulkorwee Dacoits in the Southern Muratha Country is a peculiar feature. Their leaders, or Naiks, are not so by hereditary right. They owe their elevation to their superiority in spirit and address, and their followers pay them a ready obedience. A Kulkorwee Naik's quota ranges from three to seven or eight men; burglaries are generally committed by independent quotas. A combination of quotas is necessary when open gang robbery is to be committed. In all cases, every disposition is made, and every information regarding the premises to be plundered obtained, beforehand, so that, in the actual attack and plunder, little difficulty is experienced by the depredators. The infirm, and those accidentally prevented from joining the adventure, receive a share of the booty; a portion being also assigned for the support of widows, and those who cannot help themselves.

5. Dacoits are not necessarily Kaikarees, or Kulkorwees. The proceedings submitted with my letter No. 191, dated 1st September 1853, show an organised gang of villagers,—Muratha Beruds following this calling; and the dacoity at Bussapoor, in the Belgaum Magistracy, in March 1852, was perpetrated by villagers who had combined for the purpose, and who, apparently, were aided by Sonars, who received the property stolen. Neither does it appear to me that Naiks, and leaders of gangs, are necessarily the most notorious among their comrades. The confession of Bhowanee, commonly called Galkut Bhowanee, who was not a Naik, submitted with my letter No. 190, dated 31st August 1853, shows him to have been a cold-blooded murderer and Dacoit.

6. With a knowledge of the circumstances stated above, I am not of opinion that it would suffice to bring to trial the most notorious Dacoits, such as Naiks, leaders of gangs, and those who have been implicated in dacoities of an aggra-

* No. 5 of proceedings submitted with letter No. 167, dated 27th July 1853.

† No. 6 same proceedings.

vated character. I think the Officers of the Dacoity Department must be allowed a wide discretion in this matter, and that the specific law applicable to the case should be allowed to take effect on every conviction. Though Kul-korwee and Kaikaree Naiks have been seized and convicted through the exertions of Captain Hervey, yet the organisation of the tribes has been in no measure crushed, though a severe blow has been dealt to them. Though subdued for the time in the Southern Muratha Country, their operations are being carried on in the neighbouring Bellary Magistracy, where forty-nine dacoities occurred last year, as stated by Captain Hervey in his letter No. 176, dated 26th ultimo, submitted to Government on the 3rd instant with my letter in the Judicial Department No. 1.

7. In the 9th paragraph of your letter under reply, I am directed to state whether, with reference to the great numbers of Dacoits sentenced to transportation, some provision for their families be not called for. In reply, I would state that the numbers sentenced to transportation from these districts bears but a small proportion to those still at large, and that their families, by the custom of the tribe, are provided for by those who remain.

8. I am not aware of the arrangements adopted in the North-Western Provinces for the encouragement of industrial habits among members of predatory tribes; but I am inclined to think that the success of any colonial organisation must, in a very great measure, depend upon the strictness of the supervision exercised. Loss of personal liberty I believe to be an essential, for otherwise the members of this colony would, from predilection and inveteracy of habit, use their freedom to indulge old tastes, by entering upon nocturnal expeditions, and to promote evil by communicating with old associates beyond the colony. The women of these tribes are excellent couriers, and the celerity with which they communicate information to great distances is remarkable. However much humanity may require the amelioration of these tribes, a change in their habits is not, I think, to be accomplished by a free colonial organisation; but I am persuaded much good would ensue, were Captain Hervey authorised to establish at this place a Penitentiary and School of Industry for convicts, approvers, and their families, such as exist at Jubbulpore. A few such Schools in different parts of India would, in the course of a generation or two, eradicate the evil habits which the members of these tribes contract from their earliest childhood.

I have the honour to be, &c.

(Signed) J. D. INVERARITY,
Political Agent Southern Muratha Country

Political Agent's Office, Belgaum, 11th January 1854.

EXTRACT PARAGRAPHS 1, 5, AND THE FOLLOWING PARAGRAPHS
OF CAPTAIN HERVEY'S LETTER No. 8 TO THE SECRETARY TO GO-
VERNMENT JUDICIAL DEPARTMENT, DATED 24TH JANUARY 1854.

1. I have had the honour to receive your letter under date 6th instant, No. 68, calling my attention to the wishes of Government in the preparation by me of future cases submitted for final trial; and desiring me to furnish my opinion "whether it may not suffice to bring to trial only the most notorious Dacoits, such as Naiks, leaders of gangs, and those who may have been implicated in dacoities of an aggravated character."

5. On the other subjects of your letter, namely whether it would not be sufficient to proceed only against the leaders of Dacoits, and whether some due provision for the families of those who have been convicted is not now urgently required, or some colony established, in which they might be encouraged to industrial habits, I have the honour to submit, that from what I have learnt of the habits of professional Dacoits, it would, in my humble opinion, be not only attended with very evil consequences to proceed against but the principals of gangs, of which every member almost is an expert gang robber, and capable at any time to conduct a dacoity, but that to do so would render, in a manner, nugatory, the best efforts of the Department in suppressing a crime of such magnitude as dacoity by professional gang robbers, handed down, as such a profession has been to them, from time out of mind.

6. To lead to a proper understanding of what I would take the liberty to advance in support of such an opinion on so important a subject, I would venture to trespass upon the time of Government with the following observations, supporting the same with a few prominent out of many corroborative circumstances that have happened within my own official knowledge.

7. The law especially enacted for the "better prevention of the crime of dacoity" (Act XXIV. of 1843) was considered necessary, as ensuring "more stringent measures for the conviction of professional Dacoits, systematically employed in carrying on their lawless pursuits in different parts of the country." Such are the words of that law. It determines, as was and is notorious, that such people exist throughout the empire, and that they must be put down; and, therefore, that *whoever* shall be proved to have belonged at any past or future period to any such gang of Dacoits, anywhere, within or without the Territories of the East India Company, *shall be punished*; the Act of the Legislature thus leaving no discretionary powers, I submit with great respect, to any authority, short of directing the punishment of *every* Dacoit.

8. The instructions issued to me by Mr. Secretary Lumsden, in his letter

No. 6382, under date 29th October 1850, were that I should take every precaution against the acquittal of any Dacoit prisoners.

9. The Honorable the Court of Directors, in their despatch to the Government of India No. 27, dated 18th September 1850, forwarded for my guidance, stated (paragraph 140), that they felt it "necessary to renew their injunctions that none of the effectual precautions originally adopted for the security of the criminals (hereditary gangs of Dacoits, &c.) be suffered to be in the slightest degree relaxed"; adding, in their letter to the Bombay Government No. 18, under date 1st August 1849, paragraph 5, that "they hoped the measures adopted for the suppression of the crime would be as effectual under the Bombay Presidency as they had proved elsewhere in India."

10. In my Report to Government, No. 110, dated 10th July 1849, and in subsequent despatches, I have shown that the Dacoits, against whom I have been conducting operations, *were all professional gang robbers by hereditary descent*; that, with unbounded license, they had systematically parcelled out among them the whole country, each partition forming the "preserve" of the gang to which it had been apportioned; that poverty urged them no more in their evil practices, than the desire to earn a livelihood propelled any operator to frequent efforts in his vocation; and that the punishments hitherto awarded them *had not served to check them from wrong-doing*.

11. The annexed minutes of a meeting of Dacoits I lately held show to what extent such efforts on the part of these Dacoits have been renewed; that incarceration has been to them but a temporary calamity—temporarily affecting their liberties, not repressing their evil propensities.

12. An inhabitant of the tract of country that formed the beat or preserve appertaining to Balia,* and Nad Tookya, Naiks, has, in the proceedings in that case, in speaking to the dangerous character of these Dacoits, declared—"I swear by Ishwur, that what I have said is truth; but should this be told to these people, and they at any time be released, and come back, they will have their revenge against us, and ruin us; and I represent this to the Sirkar, that precautions may be taken against them for the future, to enable the ryots to live out of fear." Another, in the same case, that the Dacoits "were always moving about—in harvest-time plundering the fields; the cultivators, from the dread their revengeful character created, refraining from any complaint against them"; but that, since their arrest, "no one's house was robbed, every one living in ease." Another, in the same case, declaring they were "always eating, and drinking, and squabbling—never labouring; their women extorting grain from the cultivators, through the fear the tribe was held in."

* Case No. XII. of 1853, tried by Mr. Inverarity, Political Agent Southern Muratha Country.

13. In the same case, approver Bheema has detailed how, because a ryot, to prevent one of their women from carrying off the ears of corn she had been pilfering from his field, had snatched away a blanket from one of them, the act was "taken to heart," a gang was assembled at night, the entire threshing-floor plundered, and the man's life taken.

14. Although represented by me to be not a part of the system of the Dacoits infesting the territories comprehending this Presidency to design murder, their outrages have, as my proceedings amply testify, been attended with violence and bloodshed, and often with murder.

15. Plundered parties, crowding my Court, have reiterated the statements already on the records of the local Magistrates, of the sudden rushing into their houses, in the dead of night, of fierce men, with muffled faces or daubed with streaks of paint, holding lighted torches, and armed with swords or bludgeons; of the remorseless rapine they committed; of terrified wives and daughters, with lacerated ears and nostrils, injured wrists and ankles; of affrighted old men and women, and younger men with broken heads, or sore from blows and buffets; of doors and windows broken down, and closets and boxes laid open and gutted; rooms rifled; their household gods desecrated, their sanctities invaded, and themselves ruined, often past redemption, by ruthless scoundrels, whose only excuse for such acts has been *that such was their profession*: no succour at hand,—the village guardians concealing themselves, the neighbours mute and in the deepest awe,—they, in terror, had to succumb to the outrage, and every indignity, uncared for; till the noise of shouts and musket-shots, the sounding of conches and drums, and the bombastic entry into the premises of the village authorities, now come to assist them, made them feel some assurance of the robbers being really gone, and themselves left alive!

16. In the Bagulkote gang robbery, the owner of the house, a rich banker, but a feeble and aged man, being speared by a Dacoit, a young lad, his grandson and heir, rushed forward to hold up the murdered man:—"Fifty rupees for you, beyond your share of the spoils, if you kill him!" cried out the Naik of the gang to one of the bandits; and the lad was slain on the spot! A nephew succeeded to the estate; two of the Dacoits were hanged: the house was one day found in flames, and was burnt to the ground; the nephew soon after died, after a short illness. The husbandless survivors, forbidden by their laws to re-marry, and without any male heir, are now the sole representatives of the once flourishing firm!

17. In the case of the Kullolee gang robbery, the plundered party declared that the robbers "essayed in vain to withdraw from the wrists of his son" (a young lad) a pair of silver bracelets." A Dacoit thereupon suggested that his hands should be lopped off; another, that his arms should be broken: a knife was produced, and they prepared to do the deed, but again endeavoured to get

the bracelets off by other means. "They dragged and pulled at them, and then tried by applying oil. Next they rubbed the arms over with rice husks, and at last succeeded in getting possession of the coveted ornaments, only after they had excoriated and lacerated the poor lad's hands." They treated similarly a little boy in the Butgeera dacoity, and in the same way a young girl in a gang robbery in the Tanna Collectorate; and in a dacoity at Hutnee, they were on the point of "chopping off the feet of another young girl," in order to gain possession of a pair of silver chain anklets, but only desisted on being implored by her mother to refrain.

18. For such acts of pillage, too, it has been exemplified *that others than the guilty parties have suffered punishment.*

19. It will have been perceived, likewise, frequently in the cases sent up from this Office for trial, that it has been testified, the terror the people of the districts generally have been relieved from, by the proceedings of the Department against these robbers: "People are now able to sleep," says one man in a case now under preparation; another, that "while the robbers were at large they inspired great fear, no one knowing what they might not be about; but that now no robberies took place, and the minds of the people were at ease."

20. Though such has been the testimony borne to the feeling of security evinced by the subjects of Government while the operations against the Dacoits proceeded; on the other hand, there was much alarm spread everywhere when it became known that several of them had been acquitted by the Judges of the Sudder Foujdaree Adawlut. "Since (reports a Police Amuldar in a case now pending trial) the operations of this Agency against the Kairaree tribe, his Talooka had enjoyed much prosperity, the ryots being happy; and, excepting that they were aware of the people of certain villages having been in concert with the robbers, there had been no fear anywhere; but that now, *owing to the rumour of several of the robbers having been set at large, people had begun again to be alarmed*"; and that if I would "but take some effectual measures against the tribe, it would tend much to the comfort of the ryots, as a proof of the regard for them on the part of Government."

21. On the subject, again, of colonising these predatory tribes, in my report to Mr. Secretary Lumsden, No. 114, dated 23rd November 1848, I ventured an opinion "that such a measure must be found practically to be most difficult of accomplishment." I stated, that their habits of life were unsettled—rapine was inherent in their natures; that they were predisposed to subsist by open depredation, from it having formed their *only means* of livelihood; and that, owing to their peculiar and exclusive habits and customs of intermarriage, &c. such persons in any colony, in our agricultural districts would always be very troublesome neighbours, *unless forced by pressur*

blend with the rest of the community, to forego their caste distinctions, and to earn their livelihood, like other men, by honest industry ; but which, I represented, might, except they were all convicted robbers, be with justice regarded as an infringement upon the liberty of the subject, of which we are all so jealous ; and even, if enforced, “ would, as impelling a very difficult people to civilisation, require such continued efforts, and sustained zeal and vigilance, as in the end, I thought, would be found nearly impracticable, and supererogatory.”

22. In a subsequent report, to Mr. Lumsden's letter No. 83, dated 19th March 1850, I proposed that, as the tribe mustered a numerous body of hardy and indefatigable men, I thought a large number of them would be ready to serve Government, *after conviction and sentence*, as a detective police. This was rejected, as not to be entertained for a moment ; and Colonel Sleeman, in his report to Government No. 1525, dated 26th November 1850, said that he thought the rejection of my proposal very judicious, as that such classes of offenders should be thinly mixed up with establishments composed of other and untainted classes, in order that they might gradually lose all those class feelings and habits which tend to separate them from the rest of society, and that their children might grow up like those of other people, altogether free from such habits and feelings ; also that their sentences should meanwhile remain suspended over them, to be carried into full or partial execution on all occasions of misconduct.

23. Alluding, however, to my report above adverted to, in paragraph 21, Colonel Sleeman stated in the same letter, paragraph 28, his belief *that no advantage would arise from colonising such people*, or of placing guardians over them ; that he had known of numerous instances *in which both had failed, and not one in which either had succeeded* ; that small police guards have been placed near such robber colonies as guardians, but *that they have always been found to connive at their offences, from motives of fear and of interest.*

24. As a remarkable example of the difficulty of reforming such people, I would here submit to notice what has happened within my own experience. Owing to his years, and, as I thought, his infirmity, I had permitted an aged Kaikaree Dacoit of eighty, who had so long ceased from taking any active part in dacoity that no one of the approvers with me had been his actual accomplice in any robbery, to reside in the lines of the Department at this Station ; also a young Kaikaree lad who had not yet been present in any gang robbery. Three other lads, whom I had before released for the same reason, also another old man between sixty and seventy years of age, whom also I had looked upon as an “ unfit,” I suffered to reside in the neighbourhood, having obtained employment for all as daily labourers on the roads

under the Executive Engineer, with the exception of the first old man, who was too aged to perform any manual labour. After some months, I was very much concerned at learning of some gang robberies having taken place in the immediate vicinity of Belgaum! I felt, that as I was then engaged in having so many Dacoits punished, it was not likely that any distant gang would be so bold as to visit this neighbourhood; and I began strongly to suspect that some of the people about me were concerned. After some little time, I succeeded in ascertaining, beyond every doubt, that the above persons formed indeed the gang, fostered, in a manner, by myself! Four of them admitted the fact: the first old man had obtained all preliminary information as to the houses to be robbed—he planned the robberies; the second old man conducted them in person; the lads formed his gang. It had been regularly organised, and everything that was done had been done systematically. The responsibility of this fact seemed to me to be enormous.

25. It will be a curious coincidence if the above circumstance should operate with Government more strongly than anything else I have advanced against the leniency proposed to be exercised. To be compelled to oppose clemency, and not to meet in the same spirit the magnanimity by which it has been prompted, is the most humiliating feature of my duties; but I am assured that Government will feel, from what I have shown, that protection to the lives and property of its peaceable subjects is the paramount consideration. I indulge, even, in the hope that it will be perceived, that while such an atrocious crime as dacoity continues to be practised by a people who have for generations been a pest to the inhabitants of the country at large, that while such people continue addicted to their evil habits and tendencies, the time cannot have arrived to relax any of the measures that have been adopted to suppress them.

26. I have shown how, before my proceedings against Dacoits, *they flourished under this Presidency with impunity*. In my letter to Mr. Lumsden, No. 4, under date 7th January 1853, I represented that, at liberty, they practised "what all had at heart, and none looked upon as criminal." Colonel Sleeman also, in a report to the Bombay Government, stated, what years of experience had caused to be a conviction in his mind, that if any of the members of Dacoit associations were restored to liberty, *they would assuredly return to the crime*. Two young Dacoits, released by me at Poona in February 1850, because they had not taken part in any dacoity with any of the approvers then with me, *engaged in November of the same year in a gang robbery in the Sholapore Collectorate*. One youth was killed, the other wounded and captured. Brought to me, he gave me a detailed account of *twenty-six similar acts of crime* in which he had been an accomplice *before*

he had been released by me! It is unnecessary to illustrate any other instances of such things: if Government would further refer to other Officers of the Department located throughout the empire, they would receive similar details, and, as I believe, their concurrence with what I urge,—the miscreants must *first be rendered impotent for further mischief*, before there can be any hope for reforming the tribes to which they belong.

27. With deference, I would even advert to what an Officer of the Department stated in a report submitted to Government (Major Graham, Superintendent of the North-Western Provinces, to Captain Sleeman, General Superintendent, No. 185, dated 3rd December 1850), to the effect that, if let off with impunity, “Dacoits would soon learn of the immunity afforded under the Bombay Presidency, *and make it their Alsatia.*”

28. For the same reasons, therefore, do I, on the whole, also think, that to provision their families would be attended with the same evil consequences, except they were forcibly prevented from all intercourse with the Dacoits still at large; but this, even, would be most difficult: the quantity of work (basket and mat-making, &c.) any colony of such families could perform at home would soon exceed the demand for such articles; their inclinations would lead them to seek out-of-door labour, if to labour, rather than to steal and pilfer; many, among whom may be included the *most* of them, would become weary of their cheerless lives; no grown up men among them, they would naturally seek for husbands to be found only among their own caste-people. Access to the colony being so obtained by many, it would quickly become an asylum for thieves and robbers, or with whom the women and children would be in constant communication; for, even in the case of the families of my approvers, I find the greatest difficulty in deterring them from communicating with the rest of the fraternity; and I know that many constantly do secretly communicate with them, for which reason I am always anxious to distribute as many of my approvers as I do not require among the other Officers of the Department.

29. Notwithstanding the difficulty, however, I am in the habit of giving shelter to such females of transported convicts as are allied by blood to the approvers in my custody; *but all generally prefer rejoining the gangs that remain unarrested.* To locate such families, however, by compulsion, with those of the men who are assisting Government in the capture and conviction of their associates, and who have contributed towards the expulsion from the land of their husbands and nearest relatives, would, I believe, but help to keep up the worst feelings among them, and to lead to many vexations and disappointments.

30. The families of the Dacoits sentenced to transportation for life by the Sattara Criminal Court in 1851* petitioned Government to be permitted to

* On committals by Captain Hervey.

reside at Tanna, which was conceded, as communicated to me in a letter from Mr. Secretary Lumsden, No. 6347, dated 7th August 1852, and it might be ascertained what number of them may have done so, and how they have employed themselves; for although I have represented the objections I entertain to such a measure in the present stage of the proceedings of the Department, any experiment in affording people so circumstanced an asylum, and means of subsistence, is worthy of the consideration of a humane Government.

31. It has long been my desire to establish a School of Industry, such as exists at the Head Quarters of the Department at Jubbulpore, as Government will have perceived from some late communications from me; but such an institution could only be intended, as at Jubbulpore, to hold out employment and education to the families and children of the approvers of the establishment. After a fair commencement, however, and prospects of future success in such an undertaking, I think the benefits to be derived from it might, and should be extended to all those who will consent to join it, and abide by its regulations.

I have the honour to be, &c.

(Signed) C. HERVEY, Captain,
Assistant General Superintendent.

*Assistant General Superintendent's Office,
Belgaum, 24th January 1854.*

MINUTES of a DACOIT DURBAR held by Captain HERVEY, Assistant General Superintendent, at Belgaum, on the 16th January 1854.

Present,—thirty-three Dacoit approvers.

They are called upon to state how often any of them may have been in prison; and whether, on being released, they desisted from committing robberies or not?

They make the following statements:—

Approver Sunnia was seven years in the Rutnagherry Jail, for a gang robbery at a Waree near Innéree,* with ten or twelve others of his caste (two died in Jail), as well as two Hindoo accomplices. All the others, including self, on their release, *reverted to the crime successfully for about seventeen years*; deponent committing in that subsequent interval *about fifty-nine dacoities*. Lutchmun Naik was one of the number; and he (Lutchmun) with

* This was about the year 1829.

deponent, again got seized for another gang robbery at Kolmah, near Rutnagherry.* Lutchmun was *not actually present* in that robbery, *but he was sentenced to life transportation*. The rest of those seized at the same time, including approvers Mussoo Naik, Kurroo Naik, and Ellia Kongaria, and deponent, *who all were in the robbery*, were released about nine months subsequently. *All again reverted to the crime*. Lutchmun effected his escape from the Tanna Jail, and, rejoining the tribe at Poona, went off, first to those of the caste practising in the Beer tracts (in the Moghullai), from where, after committing several robberies with Gondah Naik and others of those beats, he rejoined his former associates, and, with them, *continued to carry on gang robbery in the Poona, Nuggur, Khandeish, Moghullai, and Sattara countries*; till at last he was, with six others, *again seized for a robbery at Kullédhoon, in the Khanapoor Péta*; after going through a sentence *for which* of three years, awarded by the Commissioner of Sattara, he was sent here, and was lately again sentenced to life transportation.†

Approver Moria, for a gang robbery at Tass, in the Poona Zilla, was, with another, imprisoned for five years in the Poona Jail. After release, *both reverted to the crime*, and he continued to commit gang robberies up to the date of his recent arrest.

Approvers Bappoo Naik and Oongta Naik were seized, with many others of the tribe, for a gang robbery at Ootloor, near Joonere. Thirteen were released, but Oongta and six others were imprisoned for seven years in the Poona Jail; *all, after liberation, reverting to the crime*, round about Poona, Nuggur, Tanna, &c.

Approvers Oongta Naik, Posia, Timma, Satwa, and Raojee, and about twenty-five or twenty-six others of the tribe, were subsequently imprisoned for about eighteen months in the Surat Jail, for a robbery at Bulsar (Surat). On release, *all again committed several robberies*, except Raojee, who got seven years' imprisonment, and who, on being sent to Belgaum, became an approver, and was the first man that ever disclosed their system.

Approver Hunmunta, on suspicion of having been engaged in plundering some people at the 'juttra' at Allundee, was, with another, imprisoned for five years, including six months' solitary confinement in the Poona Jail. They were *not really guilty of any concern in that plunder*. On release, *they returned to the crime*. This was about seven or so years ago.

Approvers Nad Tookya and Galkut Bhowanee, and Hoossene Naik, at large,

* Which took place on the night of the 23rd May 1836.

† While lately in the Dharwar Jail, under this sentence, in a ward with some others similarly sentenced, he instructed them how to break out of Jail, which he now a second time actually did with them! but all became captured next day.

with others, for a robbery at Goolsar, in the Moolgoond Jageer, were taken to Dharwar. They were released about a year subsequently, *and went on doing their work of robbery.*

Approver Galkut Bhowanee subsequently, on account of a gang robbery at Bhooyal (Sholapore), got three years' hard labour in the Sholapore Jail, and, on release, *went on doing what he has always done.*

Approver Kullolia Naik Shorapooree, and the above *Hoossenee*, were in confinement three months on account of a robbery at Dharwar, which, however, was done by the approver's father. On release, they rejoined the fraternity. Subsequently, he (Kullolia) and others were again seized, on account of a 'ghurphôree'* at Hulgoondee. He (Kullolia) had no part in that business, though his brother Baldunda had. Three months subsequently, they were released from Almillā, *and again reverted to the crime.* He got again seized for a robbery at Jetgee; *he was seized in the fact, but was released* about three or four months subsequently, *and he returned to the crime.*

Approver Nad Tookya was seized for the Lalsingee robbery (Sholapore), and some months subsequently was released; and he then *committed several robberies* up to the date of his late capture for the Salotgee robbery.

Approvers Nad Tookya and Galkut Bhowanee were again in confinement, for a grain-field gang robbery at Nad, for six months, after fulfilling which *they again committed more.*

Approver Jamgar Tooljia was for eighteen months in the Dharwar Jail, as an escaped convict from a Jail in those days at Bagulkote, where he had been sentenced for a robbery at Sirole. On release, *he returned to the crime.* He was lately again seized at Chimulgee, with approver Kulloria Ekankhee (or One-eyed Kulloria), and eleven more, for a subsequent robbery at Ursungee. He (Jamgar Tooljia) and eleven men were fined, and released, and then he went *and committed two more robberies*, for the last of which, viz. at Sindagee, he got seven years, under which sentence he now is. Approver Ekankhee Kulloria was brought to Belgaum.

Approver Kullolia Naik Shorapooree was, with another, seized, with the plunder in their possession, for a gang robbery at Jalee Benchee, in the Shorapoor Bedur Elaka, and fined Rs. 700; *after which they returned to the crime.* In the same way, he and another were seized for another robbery at Gogee (Shorapoor Bedur Elaka), and fined Rs. 200. They were released, *and again practised the crime.* In the same way, for another robbery at Sirole, in the same Elaka, when he was again fined Rs. 200 and released. Also, for another robbery in the same Elaka, committed by others, was he, with two others of the tribe, seized, and fined in a sum of Rs. 400, and then again released, *reverting to the crime.*

* House-breaking or burglary.

Approver Bheemsyah, and about five others, got confined for six months at Poona, for a robbery upon some Dungurs, near Pêt (Poona). *On release, they returned to the crime.* In the same way, he, with approvers Dadia, Musyah, Sutwya, Jukkya, Wenkia, Fukeera, Sonia, and about ten others, for a robbery at Tass, was seized and kept in confinement for six months. After trial and *acquittal* by the Judge, *all reverted to the crime.* They had entertained a Vakeel!

Approvers Bappoo Naik, Bheemsyah, Mussoo, Sutwa, Musyah, Kurroo, Tinna, and about ten or twelve others, for a gang robbery at Mekree, close to Chand Beebee (Nuggur), were in confinement for some little time. All were released, *and returned to the crime.*

Approver Dadia, for a robbery at Bullégaum, was, with about thirteen others, seized. Four were taken to Captain Morris, at Ayejee-Maejee. After three or four months' detention, they were released, *and returned to the crime.*

Approver Dod Sahibya Naik was, with some others of the tribe, confined by Mr. Baber, for three years, in the Dharwar Jail.* Released by Mr. Nesbitt, *all reverted to the crime.*

Approver Runga Naik was, with two others, seized for a ghurphôree on the Police Koolkurnee at Bheemungur, which they had not committed. After confinement for three months, Mr. Hadow released them, *and they returned to the crime.*

Approver Mudgia was cut down, and seized, when on a dacoity expedition in the Hoolikeree limits, Badamee Talooka. Six others were also seized. They were all released a month or so afterwards, *and reverted to their profession of gang robbery and burglary.*

Approvers Ramgirree Tooljia, and Hoolgia, &c. were, eight in all, seized for a ghurphôree or burglary at Hunmunall (Bunkapoor Talooka, Dharwar). The others were guilty of that business, *but not Ramgirree Tooljia.* He and Hoolgia, and two others, were sent to the Tanna Jail for five years. A fifth dying en route, the three others were imprisoned in the Dharwar Jail for six months under requisitions for security, while three more were released. *All, on liberation, committed several gang robberies and burglaries.*

Approver Nagia, a naturalised Korwee Dacoit, was, with four or five others, in the Dharwar Jail for two years, awarded by Mr. Thackeray, for a burglary at Hoooble. On release, "*they all did again as they had been brought up to do.*"

Approver Burria Naik, and three others, were in the Dharwar Jail—awarded by Mr. Simson, for a robbery upon Mr. LeGeyt at Dharwar—for three years. Three others, including both Tooljias, were also seized, but were released. This was about twenty years ago; *and all have since committed several gang robberies and burglaries.*

* In 1824 or 1825.

Approver Burria Naik afterwards, in a burglary at Kittoor, got a sword-wound on the hand, and, being seized, was in the Dharwar Jail for six months; *after which he again returned to the crime.*

Approver Nursia, for a burglary at Gubboor (Dharwar), was seized, and in the Dharwar Jail for four years; and since his release has, with others of his tribe, and with several Dacoits of the *Wuddur* class, *committed several other robberies.*

Approver Kurree Sahibya, for a burglary at Hindusgeeree, near Misreekota, was in prison for six months, and for a subsequent robbery at Lukoondee (committed with Ramgirree Tooljia and others), with four others, was sent for three years to the Tanna Jail. One died while in it, and the others, after release, *again engaged in the crime of gang robbery and burglary.* He was again, with several others of the tribe, including approver Purwa, for a burglary at Kotbal (Raneebednoor Talooka), which they had not committed, but which was done by others of the tribe, kept for six months by Mr. Goldfinch on conjee diet. *On release, they reverted to the crime.*

Approver Hoolgia was again in confinement in the Dharwar Jail for two years, on account of a burglary at Honullee (Misreekota Talooka), after which he rejoined the tribe, *and went on committing robberies.*

Approver Andoo Mhang, village watchman, for a gang robbery at Padlee, in the Sattara State, was, with another, in the Sattara Jail for six years. On liberation, they each got two dozen stripes, and were seated upon donkeys, and their 'abroo' taken; *but they both again committed several robberies*, till he and four others got again seized for a gang robbery at Pooségaum. He thus got imprisoned for six years again, and three of the others for three years each, in the Sattara Jail. The three were flogged on release. *They reverted to the crime.*

Besides the above specified instances, the occasions have been numerous of their seizure, temporary restraint, and release. *On every occasion they returned to the crime.*

Of the twenty-seven men of the Mohole Sholapore gang lately released at Dharwar by an order from the Judges of the Sudder Foujdaree Adawlut, after they had been sentenced to transportation for life, ten have not yet been re-seized. They joined the gangs in the Moghullai, *and, in a gang robbery they lately committed in the Goonjotee Purguna, two of the number have been killed.* One of the latter (Ghora Khundaria) *was of the above ten.* This was within a month after their release from Dharwar!*

Approver Bheema was, with his brother *Murree*, released by the Saheb

* They afterwards committed several other desperate dacoities, but have all been once more seized.—March 1858.

(Captain Hervey) at Poona (February 1850). They joined Balia Naik's gang, and in it committed the gang robbery at Singnapoor (3rd November 1850), and Murree got killed in it. Approvers *Bhed Tookya* and *Kurta Sutwa* were present in that robbery.

"Scarcely a man of our fraternity but who has been at some time or other in confinement. As often as we were released, we would rejoin our gangs, and commit other robberies. For a very few of us had ever been transported prior to the present proceedings against the tribe."

"In the same way have most of those who have lately been transported on committals from the Saheb (Captain Hervey), as well as those now in custody, been more or less in confinement; on liberation they committed dacoity."

Question by Captain Hervey.—How would it be now, if any of you had your liberty?

Answer (in several directions).—"Sir, we are your servants! We could not again do as before; the Sirkar being now so resolved to hinder us."

Question.—Hunmunta (an old Dacoit): you remain silent; speak out,—what think you?

Answer by Hunmunta.—"Saheb, except we were prevented, we would all do as we have always done."

(Signed) CHARLES HERVEY, Captain,
Assistant General Superintendent.

No. 61.

THUGGEE AND DACOITY DEPARTMENT.

To H. L. ANDERSON, Esq.,

Secretary to Government, Judicial Department, Bombay.

SIR,—I have the honour to submit my Annual Report of the operations of this Department for the year 1855.

2. In the early part of the year the Office was, during my absence on duty in the Punjab, under the charge of Lieutenant Frederick Schneider,* in whose custody I had left but one Dacoit prisoner; but by the end of the year, ten others were received by him from the Districts; thus eleven untried prisoners were in custody on the 31st December 1854.

3. The following is a statement of the proceedings of Lieutenant Schneider up to the date of my resuming the Office in June last, viz:—

Under investigation at the end of 1854	11	Dacoits.
Admitted from January to June 1855	19	"
Received from other quarters during the same period	35	"
Total	65	"

* From the 11th October 1854 to 6th June 1855.

Disposed of, namely,—

Discharged	7	Dacoits.
Made approver	1	„
Committed for trial in six cases.....	8	„
Finally sentenced by him as Assistant Magistrate	3	„
Made over to the local authorities.....	23	„
Deceased before trial	1	„
	<hr/>	
Total....	43	„

Under examination when relieved by me 22 „

4. One of the cases (No. V. of 1855) committed for trial by that Officer was of a Kaikaree for a dacoity, attended with murder, at Munnoor, in the Mungolee Talooka of the Sholapore Collectorate, in March 1854. There was not any approver to this dacoity, but the man had admitted the offence to Lieutenant Schneider; and although he denied it on his final trial, he was convicted and sentenced to life transportation, which enabled me to bring up two others for the same dacoity (case No. IX. of 1855), and which also resulted in their conviction and sentence to life transportation, commuted by Government to seven years' imprisonment with hard labour.

5. With his letter to your address No. 55, under date 10th April 1855, Lieutenant Schneider submitted an account of certain murders that had been confessed to before him by a man of the 'Chapabund' class (who, with another, had been sent to this Office by the Magistrate of Sholapore); the habits of which people, as money-coiners, I had frequently brought to the notice of Government; and as one of the murders was, on a reference to the Commissioner for Mysore, ascertained to have really taken place, both men were, through the Magistrate of Sholapore, forwarded to Mysore for trial, the result whereof has not been communicated to this Department.

6. Lieutenant Schneider, moreover, caused the seizure, at Indee, of a general receiver of stolen goods, information regarding whom had been previously recorded by me; but, owing to the man's precautions, not any of the property discovered in his house was satisfactorily recognised to warrant his committal for trial, and he was consequently released by me on furnishing security for his future good conduct.

7. The following is a statement of Dacoit prisoners examined during the year under report, *including* the investigations of Lieutenant Schneider, namely:—

Under investigation at the end of 1854	11
Apprehended during 1855	19
Received from the districts during 1855	52
	<hr/>
Total....	82

Released	18
Made approvers	3
Deceased before trial	1
Committed for trial, exclusive of two approvers	24
Sent to the Extra Assistant General Superintendent at Hyderabad..	2
Finally sentenced by the Assistant General Superintendent.....	3
Made over to the local authorities	29
	<hr/>
Total....	80

Remaining under investigation on the 31st December 1855..... 2

8. The following was the result of the trials in the Court of the Political Agent Southern Muratha Country of fifteen cases,* in which twenty-six men had been committed, including two approvers, viz:—

Sentenced,—

To four years' imprisonment with hard labour.....	3
To seven years' ditto ditto	6
To twelve years' ditto ditto	1
To fourteen years' ditto ditto	1
To transportation beyond seas for the term of their natural lives....	15
Acquitted	0

Total.... 26

9. These cases were reviewed by Government, by whom the convictions were confirmed; but the sentences were commuted as follows:—

To four years' imprisonment with hard labour..	3 men (Wuddurs).
To five years' ditto ditto ..	1
To seven years' ditto ditto ..	16; two being Mhangs and one a Wuddur.
To life transportation.....	6; two being Mhang approvers.

Total.... 26

10. The commutations were ordered with the hope that as a sufficient example of the Kaikarees by the previous transportation of so many of that tribe was considered to have been made, the convicts would, on the expiration of their now limited periods of imprisonment, be induced, through the Magistrates, to settle down as peaceable cultivators.

Resolutions of Government in the Judicial Department on the Dacoity cases sent up for confirmation, in 1855, by Mr. Bell, Political Agent Southern Muratha Country.

* Cases Nos. I. to VI. committed by Lieutenant Schneider, and Nos. VII. to XV. committed by Captain Hervey.

11. But with respect to the commuted sentences of two of the Mhangs, the award of seven years' imprisonment with hard labour was resolved upon, that at the expiration of that period "they, being Mhangs and not Kaikarces," might be made over to the Magistrate "with a view to precautions for ensuring their future good conduct"; and in the case of the other two men of the same tribe,* the sentence of life transportation awarded them was confirmed, especially "because, as approvers, they would escape all punishment whatsoever; it being open to Government at any future time, upon the recommendation of the General Superintendent, to remit the sentence that has been passed upon them, and which is held in abeyance during their employment as approvers."

12. Upon the narratives of those two Mhang approvers being subsequently taken down by me, it was ascertained *that they had committed twenty-four gang robberies, three highway robberies, and seven burglaries*, and that their accomplices numbered 153 *Mhangs* residing in the Ahmednuggur Zilla, against fifty-four of whom there was sufficient evidence to warrant general register numbers being assigned to their names!

13. Hitherto the information collected in this Office against the Mhang tribe, as professional Dacoits, had been against the Mhang Ramoosce Rukhwaldars, or village watchmen, *of the Sattara country only*; but now the information was extended to the Jaglias or watchmen of the same tribe employed in the Ahmednuggur Zilla.

14. Among the crimes inquired into by me during the year, was one of the murder, during the annual fair at Tokah, in the Newasee Talooka of the Ahmednuggur Zilla, of a Mussulman vendor of piece goods. The Superintendent of Police of Ahmednuggur† strongly suspected three individuals of the Mhang tribe as the culprits, and he asked me to inquire into the case. The suspected parties were transferred to my custody. *Collectively, they admitted the crime*; but while only one of them confessed to it circumstantially, with the complicity of three others, including the other two, the latter denied their own parts in the transaction; yet each charged his companions with it to his certain knowledge!

15. The deed was a very foul one. In the first place, the murderers enticed the man away from his booth in the fair, by showing him a gold necklace (in reality gilded brass, in disposing of which as genuine gold I have

* These two men were amongst those left under examination by Lieutenant Schneider.

† Captain Hervey.

in former reports shown the Mhang tribe to be very expert,* as are also the Korwees of the Southern Maratha Country). He was told that if he would, at nightfall, meet them at a certain spot at the bank of the river Gunga, provided with the means for paying for the above and certain other articles, which they pretended to have obtained by robbery, he might make a great bargain. The poor man gave way to the temptation, and repaired to the place indicated; but presently they set upon him, and held him down. He entreated them to spare him; but, with a huge stone, they smashed his head, and after appropriating a handkerchief or roomal, and the money with which he had come provided, the corpse was flung into the river, with the same large stone fastened to it. The body never appeared again.

16. The above men admitted also to me their participation more or less in six gang robberies and three burglaries, some of which were authenticated; but as none of my approvers were acquainted with them, I sent them back with their confessions to the Superintendent of Police of Ahmednuggur, before whom, however, they denied their statements to me; but as that Officer had no doubt of their criminality, he again consulted me about them, and eventually, at my suggestion, he submitted the whole of the documents appertaining to the case to the Commissioner of Police, under whose consideration they now are.

17. The following is a return of dacoity cases for the year 1855, perpetrated in the Districts within the circle of the superintendence of this Agency below the river Nerbudda, namely :—

Dacoity Cases in 1855.

In the Belgaum Collectorate	3
Dharwar do.	3
Sholapore do.	2
Sattara do.	4
Poona do.	2
Ahmednuggur do.	1
Nassick do.	2
Tanna do.	2
Khandeish do.	2
Angria's Colaba do.	0
Rutnagherry do.	2
Surat do.	1
Southern Muratha States	0

* Vide tribe No. 24 in Captain Hervey's List of Wandering Tribes, and the confession of Ranoo Mhang, in Vols. I. and II. of the printed Selections from the Records of Government in the Police Branch of the Judicial Department.

In the Sawunt Warce States	0
Kolapore do.	0
Akulkote do.	2
Total....	<u>26</u>

Dacoity Cases during 1854.

18. The number of Dacoities committed in the same districts during the year 1854, as stated in my last Annual Report (No. 170, dated 11th September 1855), amounted to *forty-nine*.

19. The *decrease*, therefore, is twenty-three.

20. In the above twenty-six instances of dacoity, nine persons were murdered and thirteen wounded, inclusive of two Dacoits killed and four wounded; the plunder was to the value of Rs. 10,140-5-4; of which to the extent of Rs. 3,399-15-4 was recovered; while in seventeen detected instances 320 persons were arrested on suspicion by the local Magistrates; of whom ninety were punished with various limited terms of imprisonment, not exceeding three years (with the exception of two men, who were transported for life in one of the cases *not* attended with murder); 135 were released; one man died; and ninety-four remained under investigation at the close of the year.*

21. I would beg to observe, that it does not appear *that any Kaikarees were implicated in any of the above instances of dacoity*; that the dacoities in the Sattara and Poona districts were supposed to have been perpetrated by *Mhang Ramoosees*; those in the Ahmednuggur and Nassick districts by *Bheels*; in the Tanna Collectorate by *Thakoors* and *Kolees*; in the Rutnagherry Talookas by *Koonbees*; in the Akulkote and Sholapore districts by *Dhers* and *Villagers*; and in the remaining districts by persons at present unknown.

22. With regard to the crime of burglary, it would appear that in the Belgaum and Dharwar Collectorates, in which that crime is believed to be committed oftener by *professional Dacoits* than by other persons, the number of instances of that description of robbery amounted, during 1855, to 312, which is an increase by 54 over the return for the year 1854, in which the instances had amounted to but 258. To the above I may add 168 in 1855, in the Sholapore Collectorate, in which, also, the crime is often committed by *Dacoits*; thus creating a return for 1855 of 480 cases of burglary, attended with the murder of one man and two wounded, in the Sholapore, Belgaum, and Dharwar Collectorates; a proportion of which were without doubt committed by *professional Dacoits*, but to what extent I am unable to

* This is a statement of the proceedings against the suspected parties by the local authorities.—(March 1858.)

say, for the reasons given in my former reports on this subject, namely, because burglary is a crime so much committed by all classes of robbers.

23. The value of the property reported to have been plundered in the above 480 cases of burglary was Rs. 30,638-6-3, of which to the extent of Rs. 7,964-3-8 was recovered. The persons seized by the local authorities on suspicion numbered 455, in 176 instances; of whom 233 were sentenced to various short periods of imprisonment. Among the seized parties *were seventeen Kaikarees*, of whom four men were registered Dacoits.

24. I stated in paragraph 12 of my Annual Report for 1854 (No. 170, dated 11th September 1855), that, with reference to 'Bhar' Robbers, my inquiry into the habits of 'Bhar' robbers, I would defer making any further report on the subject until the result was known of the trials of the prisoners of that class that had been in my custody.

25. They were transferred to the Office of the Magistrate of Belgaum, by whom the case was entrusted to his Assistant, Mr. C. Shaw, to whose great pains in preparing which for final trial—a labour which, owing to the voluminous documents appertaining to it, and to the intricacies with which it abounded, was not of an ordinary nature—I have much pleasure in adding my testimony to that recorded by the Session Judge who conducted the trials.

26. As those trials have terminated with but indifferent results, owing to the nature of the evidence required for the conviction of such peculiar criminals, it will not be out of place to bring under notice the whole of the proceedings appertaining to the inquiry from the period my attention was first turned to the habits of these people; that it may be taken into consideration whether there is any defect in the laws applicable to such offenders, that prevents their proper punishment; and I therefore venture to submit for the information of Government an extract (paragraphs 21 to 37—see Appendix A) from a General Report lately made by me to the General Superintendent, No. 14, dated 22nd January 1856, in which the whole subject has been reviewed from first to last; and which I trust may be found of sufficient interest to be taken further notice of.

27. For, although the trials alluded to have resulted in the conviction of three members of the gang, inclusive of the very notorious leader of the confederacy (named Essajee Punt), the example of their arrest *would not appear to have deterred their unarrested associates from practising the crime, even while the trials were yet going on*; for another gang of the same class of offenders has recently been under the examination of the Magisterial Authorities of Poona, from whose proceedings it appears, that they had lately successfully practised *bhar*, by passing off base coin for genuine currency,—a sum of Rs. 3,574 of such spurious money, *coined by themselves* in imitation of the 'Chowkoonee'

Further late proceedings of
Bhar Robbers.

or square rupees, was found in their possession. The swindlers had assumed the disguise of Beldars, on their way to Aurungabad in search of employment, and they gave out that they had, while working in a quarry, found a quantity of buried money; and the better to make it appear that what they pretended to allude to had long been in disuse, they covered it with something to give it the black appearance of tarnished silver; they were provided at the same time with a small quantity of genuine money of the same currency, which they freely handed over to their dupes "to be tested." When arrested by the Joint Police Officer at Seroor, they had succeeded in passing off Rs. 3,978 of such base money; and the Foujdar of the city of Poona, in reporting upon the habits of these men to the Superintendent of Police, observed that "it pitted him to hear how often people had been victimised by them"; that they were in the habit of carrying on their swindling transactions "not only in British territories, but in the Nizam's Country, at Indore, Gwalior, and in other States; and under this Presidency in the Poorundhur, Kheir, Bhimthuree, and Hawelee Talookas of the Poona Zilla, as well as at Ahmednuggur, Sholapore, Sattara, and in Bombay itself"; and he has also ventured an opinion that, for the purposes of conviction, "such people should be tried *on a general charge*, and *not* in separate and distinct cases." This, it will be remembered, I had myself advocated.

28. No particular law was found applicable to the above transactions; for it was discovered, owing to the decisions of the Judges of the Sudder Foujdaree Adawlut in former instances, that the prisoners could not be tried for uttering counterfeit money, *because it was necessary that the money so uttered should be in counterfeit of the coin of the realm, i. e. of the Honorable East India Company's currency, which the money these men had passed off was not!* The Magisterial Authorities were therefore obliged to forego every instance in which they had uttered spurious money, and to select but a single case in which the swindle had been effected by passing off *spurious ornaments*, and to send up *but one man* for trial, on, as in the case of the bhār robbers tried at Dharwar, *a charge of conspiracy*, which, as at Dharwar, *failed in ensuring any satisfactory results*, although, I believe, conviction of that one man followed; *while thirty-two, of whose guilt there was no doubt, were released without trial!* It was recommended that the false rupees should be returned to the liberated parties! To this the Superintendent of Police very properly objected, and the Magistrate finally ordered that the whole should be reduced to metal (tin), and that the duped parties should receive the proceeds of the sale of that portion thereof that had been passed off upon them, and that the remainder should be credited to the public treasury!

29. In connection with my proceedings during the year under report, I may mention, that, as the families of several of the transported members of the Kaikaree gangs had for some time located themselves in the Northern

Report as to the Labourers on the Railway Works in the Northern Konkun.

Konkun, in which the tribe used formerly to depredate so much, and as there were several fugitive Dacoits who could not be traced, but were supposed to be employed in the railway works in the Tanna Collectorate, in which, owing to the great demand for labourers, a large concourse of people had congregated from the upper countries in search of employment, I considered it a favourable opportunity, on finding myself relieved of the whole of my prisoners on the close of the trials of the season,—Dacoity, too, having to a great extent been put down in the Southern Muratha Country, and the Dacoits fled,—to remove my establishment into the Tanna Districts, with the view to a close examination of the men assembled along the railroads; a measure that had, moreover, been proposed to me by the local Authorities, and which I had long meditated, but had not any leisure to carry out; for it was believed that there were several criminals among the many persons employed on those works, composed as they were of all castes of people—the comparative frequency of crime in the Tanna Zilla over other Districts favouring the impression; and as I felt that this was a duty that required my personal superintendence, and might not be entrusted to Native agents, whose proceedings might create a distrust in the minds of the men engaged by the Railway Company, to the obstruction, perhaps, of works of such great importance, I moved my Office into the Konkun, the more conveniently to supervise the same.

30. While, during the day, my agents could mix with the crowds of people engaged everywhere, it was at night only, when these masses had resolved themselves into their own distinct tribes and associations, that they could be carefully watched when retired to their separate ‘tandas’ or encampments; gathered in which they would freely talk of themselves, while giving themselves up to the enjoyment and repose of the hour. At such periods, it has been quite interesting to observe them. Free from cares, forgetful of the labours of the day, glad of their earnings, engaged in unrestrained discourse, in song, or in mirth; no revelry anywhere, nor any clamour, except occasionally, when the accidental conflagration of their temporary huts bestirred the particular colony that belonged to them, these primitive people present an instructive lesson of the contentment to be attained where labour shuts out want, and leads men of such roving dispositions, and even plundering habits, to rejoice in the blessings of an honest and abundant livelihood; and it is a subject for congratulation that, considering the low price of labour in the upper country, the prospect of continual employment in the many great works in the

course of construction, whether at Vohar or on the railways, is likely to lead so many of the poorer classes of people located in our districts to flock to them in quest of it. For it affords me satisfaction to be able to report, as far as my personal observation enables me, that, as a body, the men now on those works would seem to be sufficiently remunerated to feel themselves restrained from having recourse to any lawless pursuits, *if at the same time* the Police of the districts shall, by its vigilance and general intelligence, offer no room for the facilities and opportunities for wrong-doing it may be hard for such people to withstand; for I may observe that, when lately travelling in Upper India, through districts in which similar works were in progress, I did not perceive, I thought, the same disposition to be contented, if I might judge from the refusal to assist me when very late one night I found myself at, I believe, a *Sonthal village* in the Rajmahal hilly district, and was very anxious to push on to Raneegunge in time for the forenoon train to Calcutta; for although I had offered double, and then even four times the amount of the ordinary rate of hire, if they would, any number of them, help me on, they sullenly declined, because, as they declared, they were always disappointed of their wages! but as this was very shortly antecedent to the outbreak of the Sonthal insurrection, perhaps this supposed discontentment was peculiar to that tribe only, as my progress was too hurried for me to observe whether the same feeling extended to the workmen lower down.*

31. I am, in the above remarks, regarding these people *as a body*; for I have no doubt there are many individuals among them who would not demur in taking advantage of any opportunity for committing crime, which, perhaps, some of them find ways for doing; for although we have met with and apprehended but a single registered Dacoit among them, it would appear that, in the Tanna Zilla, there are, according to the Commissioner of Police, more deaths from alleged accidents, more pretended suicides, and more people found dead from causes unassigned, than in any five other Zillas put together; which, as not constituting acts of plunder, but perhaps *murder*, cannot, I think, under the circumstances I have above entered into, be laid to the charge of the several wandering tribes congregated in the Northern Konkun.

32. Believing that some clue to a circumstance so seemingly mysterious might be elicited, while my own Agents were deputed to gain local information on the subject, from an inspection of the inquest reports of the Zilla, I requested the Magistrate of Tanna to be furnished with all the documents of that nature for the

* At that time (March 1855), the railway from Calcutta extended only as far as Raneegunge, a distance of 126 miles from Calcutta, and had but recently been opened.—(March 1858.)

last four months ; from an examination whereof, it appeared that inquests had during that period been held upon 119 dead bodies, of which, according to the report of the juries, 19 were of infants procured by abortion; 39 of persons who had fallen into wells, creeks, or rivers, and were drowned, including 2 who were drowned in a fit while bathing; 5 of persons who had been killed by wild beasts, or died from snake-bites; 8 of persons who, under the sufferings of sickness, had destroyed themselves; 1 of a woman who had been murdered by her husband; 7 of persons who had committed suicide,* among whom was the murderer just alluded to; 17 of persons who had lost their lives from falling from trees, bridges, and other high places, including one man who was killed by falling from a cart; 2 of men who had died while in a state of intoxication; 2 of persons who had died, as at first stated, from causes unknown, but afterwards ascertained to have died natural deaths; and 19 of travellers, some of whom were declared, upon an inspection merely of the bodies, and in the absence of the evidence of relatives or acquaintances, to have met with their deaths from poverty, starvation, or want of care during illness.

33. Perhaps the cases included under the last category may be regarded as the most serious and melancholy. The friendless and homeless must always, particularly in India, be the keenest sufferers in sickness or sorrow, and the easiest victims of murderers; but whether such persons meet with their deaths *at the hands of poisoners*, or really die from the causes above assigned, I have not been able to gather from the documents I have examined, or from the inquiries of my Agents. If the juries, on such occasions, were carefully convened only of intelligent persons, and promptly, *and are not packed*, it would be hard to believe that they should be unable to come to an opinion when murder has been committed and when not, and which it may be supposed they would be careful to declare; but as, nevertheless, in the absence of medical advice, it can often happen, and did happen on one occasion in the Ahmednuggur Zilla, that the man who has died from the effects of poison should be declared to have died from natural causes, I am unable at present to say whether or not any of the above deaths were from the effects of deleterious drugs administered for

* The deceased in one of these cases was a woman, who, by the jury, was declared to have drowned herself in a well on account of disagreements with her husband. The Superintendent of Police rather thought that she had been thrown into the well by him; and that Officer had similar doubts in three other cases, viz. one touching the death of a new-born infant, another that of a Bhungee who was found dead in the shallow part of the river under the walls of the fort of Tanna, with a deep wound in his side, and a bloody razor close by on the rocks; and the third of a young wife, who in sulks used constantly to be leaving her husband's house, and was at length found drowned in a river; but still, I believe, without any conclusive grounds for such suspicions.

the purposes of robbery ; but as it is now notorious that that crime exists to some degree throughout the districts of this Presidency, *from which death not unfrequently ensues*, I will now proceed to that subject.

34. Having, in the General Report I have before adverted to,* ventured to advocate once more the expediency of making Act 'Datura Thuggee' considered. XXIX. of 1850† a general one, with the view to the better suppression of the crime of robbery by means of drugs (*datura thuggee*), and as my observations on the subject may be referred to Government, it is proper that I should submit to notice in the present report the extent of that crime within the districts of this Presidency during the year under review.

35. The *reported* instances thereof during 1855 present the following return, viz :—

Number of reported Cases of Datura Thuggee in the Bombay Presidency during the Year 1855.

In the Belgaum Districts, four cases, attended by the deaths of two persons.

In the Dharwar Districts, three cases, unattended with any death.

In the Sholapore Districts, three cases, attended with one death.

In the Sattara Districts, one case, without death.

In the Poona Districts, three cases, without death.

In the Ahmednuggur Districts, three cases, without death.

In the Nassick Districts, six cases, attended by the deaths of four persons.

In the Khandeish Districts, two cases, unattended with any death.

In the Tanna Districts, four cases, without death.

In the Angria's Colaba Districts, four cases, without death.

In the Rutnagherry Districts, nil.

In the Surat Districts, two cases, attended by the deaths of two persons.

In the Ahmedabad Districts, nil.

In the Broach Districts, nil.

In the Kaira Districts, nil.

In the Southern Muratha States, nil.

In the Sawunt Waree Districts, one case, unattended with any death.

In the Sholapore Districts, two cases, without death.

In the Akulkote Districts, two cases, without death.

Making a total of forty cases, attended with the murder of nine persons.

36. The property stated to have been robbed on the above occasions amounted to Rs. 550-12-0, of which to the value of Rs. 177-2-6 was reco-

* To the General Superintendent, No. 14, dated 22nd January 1856.

† Act XXIX. of 1850 is an Act "to amend Act XXXI. of 1838, for the Prevention of Poisoning" (Clauses III. and IV.); but its scope is confined to the local jurisdictions of the Supreme Courts at the Presidencies of Calcutta, Madras, and Bombay.—(March 1858.)

vered. Fifty persons were seized on suspicion, of whom ten were slightly punished in six of the instances *in which death had not ensued*, viz :—

By Magistrates, by imprisonment for one year	4
By Session Judges, two men to two years' and one man to four years' imprisonment with hard labour	3
By Native Chiefs, imprisonment with hard labour, one man for six months and two men for seven years.....	3
	<hr/>
	Total.... 10

In the cases attended with the deaths of the drugged parties, *no culprit was punished*.

37. If the above, in support of what I have before elsewhere humbly advocated,

Mr. A. K. CORFIELD, *Senior Magistrate of Police*, to H. L. ANDERSON, *Esq., Secretary to Government, Judicial Department, No. 299, dated 1st May 1854.*

Para. 14. There were eight cases of administering poison with intent to commit murder, on account of which eleven persons were taken into custody by the Police, being an increase last year of three offences and three persons arrested. *This is a crime in which it is most difficult to obtain evidence against the accused. Of the eleven persons apprehended, but one was committed for trial before the Supreme Court, and even that case was dismissed for want of evidence.* The practice of administering datura, in order to rob the victims while in a state of stupefaction, I believe exists to some extent all over India. It prevailed very considerably on the island about the years 1833 and 1839; but I am happy to be able to report that no serious case of the kind has of late years occurred.

can be considered as any further proof of the inadequacy of the law under which the crime is punishable in the Mofussil, the extract quoted in the margin, from the Crime Report of the Senior Magistrate of Police of the island of Bombay, may, in the opinion of Government, also show, that far from anything undue in the measure I have from time to time submitted for consideration, the special Act itself (XXIX. of 1850), the operation whereof I have said might with advantage be made general for all India, barely meets—indeed it does *not meet*—the crime, even within the jurisdiction to which its provisions are specially limited. The wisdom of the declaration of Government on a former report from me on this subject, namely

that this heinous crime “could be repressed only by the severe punishment of those *convicted* of practising it,” is unquestionable; but it remains to be determined *how* they may be convicted?

38. Being about to proceed to Europe on a furlough, I may,—with reference

The proceedings generally of this Agency in the suppression of Dacoity.

to the former very great extent to which dacoity prevailed under this Presidency (namely *three hundred and thirty-four cases in 1847*) at the period

that my duties were extended to the suppression of that crime, to its gradual decrease year by year *from that period*, and to its present condition as returned in paragraph 17 of this report, namely *twenty-six cases during 1855*; also to the observation on the part of the Honorable the Court of Directors in para-

graph 21 of their despatch to the Bombay Government, No. 11, dated 5th September 1855, in reply to my Annual Report for the year 1854, namely “that the total discontinuance of the crime would be one of the most valuable boons in the power of Government to confer upon the community”; moreover, to the fact that the people by whom the crime used to be so much perpetrated in the districts of this Presidency, and against whom my operations have been principally directed, *now seldom commit ducoity*,—respectfully, in this final Report of my operations, submit to the notice of the Government under which I have for twelve years been specially employed in charge of this Agency, the result of my proceedings, particularly against the Kaikaree tribe, who so notoriously infested the districts of the Bombay Presidency.

39. The following is a return of my operations accordingly, viz :—

	Men.
Seized by this Agency	312
Received from jails and from the local Authorities on requisitions from this Office.....	297
Grand total....	609
Released, because, although Dacoits, the evidence for their conviction, according to departmental process, was insufficient	111
Made approvers*	9
Deceased before committal	5
Sent to Jubbulpore for disposal	7
Sent to local Officers for precautionary measures	60
Sent to the Assistant General Superintendent at Indore, for committal to the Court of the Resident †.....	20
Sentenced by me as Magistrate	21
Total....	233
Balance.....	376

* Namely,—

Convicts received from jails ..	6
Sent to Jubbulpore for admission	1
Escaped after admission.....	1
Recanted, and therefore remanded	1
Total....	9

† Disposed of as follows, viz :—

Transportation for life	10
Limited imprisonment with hard labour	9
Died before trial	1
Total....	20

Committed for trial and sentenced, viz :—

Transportation for life, inclusive of forty-three approvers	301
Imprisonment with hard labour for fourteen years	2
Imprisonment for twelve years	2
Ditto for ten years	3
Ditto for seven years, including one approver	24
Ditto for six years	4
Ditto for five years	3
Ditto for three years	2
Ditto for two years	1
Acquitted	16
Deceased before trial	2
Released on furnishing security, as ordered by Government, after conviction and sentence to life transportation	2
Returned to this Department after conviction and sentence to life transportation, for admission to the grade of approvers	12
	<hr/>
Total.....	374

Remaining under investigation on the 31st December 1855 2

40. From the evidence of the approvers, as recorded in their several narratives, it would appear that the number of dacoities the above had committed with them amounted to 1,151, *of which 1,048 took place within the limits of the Bombay Presidency.* Of these, a total number of 703 have been authenticated on references to the local Authorities, in which the property plundered by the dacoits was to the extent of Rs. 5,46,659-2-10, whereof to the value of Rs. 17,209-8-7 only was recovered, while detection seldom followed, notwithstanding the proclamation of rewards on almost every occasion varying from Rs. 50 to Rs. 500.

41. As the narratives of the approvers contain many interesting details of their exploits, I beg to annex to this Report a statement (Appendix B) of the approvers upon whose evidence the above operations were conducted, exhibiting their sentences, and the number of dacoities each has confessed to; also a return (Appendix C) of sixty-six selected instances of the dacoities they have recorded; and lastly, remarks (Appendix D) as to each dacoity, to which I solicit the attention of Government, presenting, as these details do, how daring and adventurous have been the people from whom the community had so long suffered.

42. As any relaxation in the efforts for the total suppression of the crime of dacoity would be attended with evil consequences in territories so overrun by wandering tribes, all more or less predatory, as are the Districts composing

this Presidency, I beg to submit to notice that there are several classes of persons infesting them who are professional Dacoits, whose habits have yet to be inquired into, and who should be narrowly watched. Also that, as detailed below, there are 1,277 persons still at large, with whom approvers have, as recorded in their narratives, committed dacoity, viz:—

Kolhatees	46
Kaikarees and Korwees	824
Wuddurs	7
Lumbances	12
Mhangs	312
Ramoosces	58
Juts or Mooltances	18
<hr/>	
Total....	1,277*

Of the above, 496 are registered Dacoits, against whom there is sufficient evidence for conviction; and the rest, or 781, are such as have not committed the crime with *two or more* approvers, as is necessary before they can be proceeded against; but who are nevertheless *Dacoits*, and will be registered according as additional information is elicited against each from the evidence of *future* approvers. I may not, in conclusion, presume to offer in this Report anything in contravention of the opinion expressed by Government when reviewing the cases lately sent up for confirmation by the Political Agent Southern Muratha Country, namely, “that to have been born and bred robbers was more their misfortune than their fault,” for every respect is due to such a sentiment; but as the duty of this Department peculiarly is to regard such persons in the shape in which they present themselves to view,—namely as dangerous people, of confirmed evil habits,—I trust that anything I may have submitted in the General Report I have already had occasion to advert to, on the subject of the commutations that have recently been ordered of the punishments awarded by the Political Agent Southern Muratha Country, in some of those cases, may, when brought to the notice of Government, be regarded as opinions consistent with every sentiment of respect, in the discharge of an onerous and very important duty.

I have the honour to be, &c.

(Signed) C. HERVEY, Captain,

Assistant General Superintendent.

Assistant General Superintendent's Office,

Coorla, 1st April 1856.

* There are not as yet any Wuddur, Lumbance, or Jut approvers with Captain Hervey. The above are the men of those tribes who have occasionally joined Kaikaree approvers in dacoity; but they have gangs of their own, and commit dacoity and highway robbery on their own account.

(Signed) C. HERVEY.

APPENDIX A.

EXTRACT Paragraphs 21 to 37 from a GENERAL REPORT from CAPTAIN HERVEY, Assistant General Superintendent, to the General Superintendent of the Thuggee and Dacoity Department, with reference to the Crime of ROBBERY by BHAR, No. 14, dated 22nd January 1856.

21. I come now to the crime of swindling by 'Bhar,' which had up to very lately remained unexposed. "Constantly committed Robbery by 'Bhar.' over a broad expanse of country, it had (as reported by Mr. Inverarity, Political Agent Southern Muratha Country, to the Secretary to Government, No. 191, dated 1st August 1854) hitherto escaped detection."

22. In the documents accompanying my Report to the Bombay Government No. 64, dated 2nd May 1854, this crime was described to be committed in the following manner :—
Bhar robbery ; its nature, and how committed.

"These men had other associates, and Essajee Punt, aforesaid, was the chief man among them in the above business called 'bhar'; the other abovenamed persons were also leading men. Essajee Punt asked me why should I go to Bombay? 'Come and join us, and do as we do, and it will be to your advantage,'—

The confession to Captain Hervey, Assistant General Superintendent, of Appa Chowan, Bhar Robber, quondam Village Schoolmaster.

for we had begun to be intimate with each other. Upon this, I asked him to say what he meant. He told me that one of their occupations was that of bhar, which was, he explained, for four or so people to associate together, and one of them, with the assumed appearance of being some important personage, to be given out to be a relative of the Shreemunt Peshwa (Bajceerao), his name so and so. This settled, a copper vessel was procured, and rubbed over with butter-milk and tamarind, in order to get it covered with verdigris, and then it was filled up with earth and stones. One or two ornaments, or some rupees, or such like, were next placed on the top of all, and the mouth of the vessel closed. It was then to be buried somewhere in the jungles, in a hole dug for the purpose. Two or so men of the gang were then made to appear to be sepoys, and one or two to be horsemen, who were instructed that, when the above vessel should be exhumed and brought away, they were to pretend to be the sepoys of Government, and to pounce upon them all at some certain

preconcerted spot, and then only to consent to release all, on a promise of being paid a certain sum of money for doing so. Matters thus arranged, the next step was for the gang to repair to some town or city, where the disguised great personage and pretended horsemen and peons were kept in the back-ground, while the rest, after finding out what rich Sowkar or other person there might be in the place who was covetous of wealth, would, under some pretence or another, strike up an acquaintance with him, and get to be on visiting terms with him. After allowing some convenient time to pass by, it would next be imparted to the said Sowkar, that a quantity of property was known to have been buried in the time of the Shreemunt Peshwa at a certain spot; and that in their company was a person who was formerly either the Peshwa's Dewan, or one of those in His Highness' confidence; and that he used in those days to be a man of consequence, but now was in poor circumstances; and that as it was not likely that any one would be ready to take anything valuable from him but under suspicion of the same having been stolen, and would rather have him taken into custody, would he, the said Sowkar, through being a great man, consent to receive charge of the above buried wealth?—or, if he liked, they would show it to him, and he might dispose of it as he thought proper, and keep half the proceeds for himself, letting them have but only the other half! Decoyed by such temptations, the man is induced to accompany the men at night to the spot where the vessel has been previously buried; which is then dug out, and opened, and the dupe requested to behold, that it is full of wealth!—eager to possess which, he gets beside himself, and requests that all should go back with it at once, or that it be given into the charge of some one of those he may have brought with him. The whole then proceed in a body forthwith with the booty. On the way, the party is intercepted by the pretended sepoy, already told off to that part of the business as above. They request to be told what it is they are carrying away, and arrest their further progress, desiring that it should be shown to them. On this, the cheats whisper to the duped party,—‘We are stopped; if we be taken into custody, we shall lose the whole of the property; we must endeavour to prevent this.’ The victim assents to this, and he is then advised that nothing short of Rs. 1,000 or Rs. 1,500 would be sufficient to effect their release, or that otherwise the property would be seized, and his own chances of profit too be lost. In his eagerness not to lose so much wealth, he is suffered to go home to produce the amount agreed to, and which he does, either in money, or by its equivalent in such ornaments or other valuables as he may have at hand. Upon this, the vessel is taken to his house, and he carefully puts it away under ground.* What has been thus obtained from him in the transaction is then

* In the mean time the gang disperse, and only meet again at some distant preconcerted place.

shared among the members of the gang, the chief man of the party getting half of the whole, and the other half being divided among the others, one share of it being kept for *darbar expenses* (i. e. to meet disbursements in case of any of their number being seized, with which to procure securities, or to bribe Karkoons, or such like). Such was the plan of proceedings in bhar imparted to me by Essajee Punt."

23. Having joined a gang of these swindlers, the following was the above deponent's first essay at the crime in obtaining by bhar from Gopalla Malce a sum of Co.'s Rs. 300 :—

* * * "This was about ten or ten and a half years ago, in the dark half of the month of Margsheersh.* Our head man Robbery by Bhar of one was Essajee Punt, and he was entitled to half of the Gopalla, at Poona. whole booty obtained by us. At his bidding, I went associated with four men, of whom I was constituted the Karbaree, or agent. We prepared a copper vessel according to our method, by rubbing it over with tamarind and curds, to give it a green appearance. It was filled with earth, and at the mouth of it certain real articles were placed, as a gold 'thoossee' (necklace), four gold 'gôtes' (bracelets), two gold 'pâtlees' (bracelets), a pair of silver chain anklets, and other things. The mouth was then closed, by a plate of copper being soldered over it. Of the party, two, named Suntoo Zingar, and Babajee *alias* the man I have above called Ramchunder Bapoojee Toolpoollé, went and buried it at a spot in the waste by Purbuttee, near the edge of a tank. It happened that I was previously acquainted with the above Malce, so that I went to him and imparted to him that a vessel full of valuables, belonging to the Shreemunt, was to be found buried in the Purbuttee common, and that one Gunpuntrao Denglé, formerly one of the companions of the Peshwa, knew of the spot; saying which, I introduced him to our associate Babajee. The man assenting to go with us for the purpose of getting possession of the property, accompanied us accordingly by night to the spot indicated. The copper vessel was dug out, and, being opened, the articles placed at the top of it were shown to him. The vessel being placed on his head, we prepared to start with it. It was not, however, necessary on this occasion to have him stopped, according to our usual custom, by pretended sepoys, for he had beforehand agreed to give us Rs. 300 for the whole; so that, *after contriving to extract from the vessel the articles we had placed at the mouth of it*, we placed it on his shoulder, and proceeded straightway to his house, *where we helped him to bury it in his 'deogurh' or chapel.*† On the following

* November—December.

† Where one of the gang was left to *see fair play*—lest the Malce's curiosity might mean time lead him secretly to examine the contents of the buried vessel.—(March 1858.)

(Signed) C. HERVEY.

day we repaired to his house, and received from him a sum of Rs. 300, by way of part payment. This money we took to our chief, Essajee Punt. He appropriated half of the amount, and retaining a share out of the other half for 'durbar expenses,' the rest was divided between the members of the gang, my share amounting to Rs. 40 in Company's and Chandoree currency."

24. I reported on this subject, in the despatch above quoted,* paragraph 19, that "I knew not that the duped parties were to be pitied, their own very reprehensible part in such transactions proving them to be themselves knaves of a lower order only, in cunning and duplicity, than the men by whom they had been so egregiously victimised"; and the Bombay Government observed, in reply, that these disclosures exhibited "a painful view of the moral constitution of the people who have been duped under the system of *bhar*, which, Captain Hervey justly remarks, is a masterly plan of consummate roguery, difficult to be met by any existing laws."—(Resolution of the Bombay Government, No. 1066, dated 6th March 1855.)

25. It happened, subsequent to the date of my Report, that several members of a gang of these wrong-doers, including the leader Essajee Punt himself, came into my custody in June 1854, shortly before I proceeded on duty to the Punjaub. It had committed numerous cases of *bhar*, and but recently one at Mhopsa,† in the Goa Territory, that had created no small stir, and was attended with the robbery of a large amount of gold dollars and other Continental money, from two influential and affluent Native bankers named Rugoonath Sett and Ramsett, conducting business under the name of the "Kullup Sowkars."

26. It had been committed in the following manner,—I quote from the revelations on the subject made to me by one of the gang:—

"After this, Raojee Brahmin held some communication with the Bunya Rugoonath, of Mhopsa, as to a 'ghurra.'‡ The Bunya assented, and desired that the owner of it should be brought to him. He, Raojee, thereupon at eventide took me to him; but as he, the Bunya,

* To Government, No. 64, dated 2nd May 1854.

† On the 6th February 1854.

‡ A copper or earthen vessel.

could not understand my language,* Raojee interpreted to him, and explained that I was acquainted with the place where the property was concealed; that it belonged to the Peshwa Bajeerao, and was buried, to the value of about twenty or twenty-five lakhs of rupees, in the *Ramghat* mountain, and that the owner of it on the part of the Peshwa had lately come down from *Bhittoor*; adding, that if he (Rugoonath) would consent to pay over to me a sum of Rs. 50,000 in ready money, he would point out and produce the whole of the property, half of which he (Rugoonath) should keep, and the other half be appropriated by the above owner.

“The Sowkar (Rugoonath) here desired that the owner should be brought to him; whereupon Raojee on the following day went to Arowlee,† for the purpose of summoning Gunputrao, Purusram, and Babajee; and on the third day he returned, bringing with him Gunputrao and Balia Muratha. I was at the ‘dhurumsala,’‡ so that at night I accompanied Gunputrao and Raojee, and went to Rugoonath Shet Bunya, who took us to another Sowkar, a greater person than himself. They and the Brahmins (Gunputrao and Raojee) then held some conversation together. The Sowkar said that if he were to see the property he would consent to pay Rs. 50,000. Gunputrao desired him to pay over to him Rs. 50,000 either in venetians (‘pootlees’) or in notes, ‘or how am I to carry away Rs. 50,000 with me?’ He consented, saying, ‘Let it be as you wish; I do not make any excuse;—only show me the property.’ On hearing this, I, Raojee, Balia Muratha, and Gunputrao, with Purusram, and Rama his servant, whom we afterwards met by the way, went to *Bhaitsee*, accompanied by Rugoonath (the Bunya), and his servant Rowloo. We took them to the mountains, and we dug a hole there, from which, by a blind, we contrived to produce a vessel having its mouth closed up. Gunputrao then took out from the vessel a piece of gold in weight two tolas, which he placed in the hands of the Bunya, who thereupon became pleased, and desired us all to return with him to his house, when he would show us Rs. 50,000 either in notes or venetians, and that we were then to bring the vessel to him, and take away the notes or venetians. This having been agreed to, Rugoonath (the Bunya) returned to Mhopsa, as did Gunputrao, Purusram, Raojee, &c. Arrived at Mhopsa, Rugoonath began to say that he was unable to produce Rs. 50,000, but only the equivalent of Rs. 2,000 or Rs. 4,000 in gold ornaments and venetians. Upon this, Gunputrao sent a message to Babajee at Arowlee,

* Seodial was a Hindoostanee Rajpoot, and he pretended to have been deputed from Benares, by the Peshwa’s representative, alluding to the since notorious Nana Saheb.—(March 1858).

(Signed) C. HERVEY.

† Close to Vingorla, a seaport town to the southward of Bombay.

‡ Or Caravanserai.

to say, *that if what he was about there was greater, the business here (at Mhopsa) would be postponed.** He also sent for me from Bhaitsee.

“Babajee returned an answer by Atmaram *that his business required much delay, so that he (Gunputrao) should conclude his for whatever might be obtainable thereby.* Hereupon Gunputrao desired Rugoonath (the Bunya) to place what venetians and ornaments he intended to be given to me, tied up in a bundle, in a box, and to hand the key thereof over to him; to keep the box in his own house, but that a man on his (Gunputrao's) side would remain there to watch it, and that whenever he (Gunputrao) brought the vessel containing the property to him, he was to hand over the venetians and ornaments to me.

“The Bunya, crediting all this, tied up the venetians and ornaments in a bundle, which he handed over to Gunputrao, and desired him to place it with his own hands in the box, and to lock it up himself; *whereupon, by a cheat, he substituted a false bundle in the place of the other one, which he took, and then locked up the box.* Rājōec Brahmin was then placed by him as a pretence to look after the box, secretly desiring him to stay there two days, and then to make off for Poona. Gunputrao then handed over the genuine bundle, containing the venetians and ornaments, to Purrusram, whom he desired to go off with it to *Nepanee*, and to put up in the dhurumsala there, as that he would follow him there. It was Purrusram who was first made to decamp; the rest of the gang, who were located, in furtherance of the transaction, at different places in the neighbourhood, had been told to escape a day previously.

“After this, I, Gunputrao, and Balia, went with Rugoonath and his servant Rowloo, for the sake of handing over the ghurra (the buried vessel) to them.

“But as our people had already taken away that ghurra, we gulled the Bunya that there was another; and, with the view of pointing it out to him, we took him to the *Ramghat*. We put up at the temple there that is by the shops, where Rugoonath began to cook his food. I was desired by Gunputrao to go on to a certain spot *on the road to Belgium*, and remain there. I went accordingly. After this, Gunputrao and Balia went under the pretence that they would go to search for the spot where the property was supposed to be placed; so they left him and joined me, and then I, Gunputrao, and Balia, made off, and in two days reached *Nepanee*, where we found Purrusram with the bundle containing the property, the whole of which was probably to the value of Rs. 6,000.”

* Babajee was, with some others of the same gang, here similarly engaged in plotting the plunder of a man named Gabriel, at Vingorla, who is now the Bread and Meat Contractor to the Commissariat Department.—(March 1858.)

(Signed) C. HERVEY.

27. Owing to the deficiency of the law (Regulation XVII. of A. D. 1827

Endeavour to have the Bhar Robbers tried by a special tribunal.

of the Bombay Code) in meeting this crime, when considered in its *organised condition*, I endeavoured that the case should be tried by a *special tribunal*;

for, simultaneous with the above robbery, other similar acts had been committed elsewhere by other members of the gang during the same expedition, upon which the whole had set out in conjunction. A correspondence

Objections on the part of the Judges of the Sudder Foudaree Adawlut.

ensued. The Judges of the Sudder Foudaree Adawlut were averse, however, to the case being tried out of their Courts. Viewing only the

robbery at Mhopsa, *unconnected with any other*, they declared that "the case was one of *simple robbery*, and that the robbers, being neither Thugs nor Dacoits, they were subject to the Court's jurisdiction, and must be tried by the ordinary tribunals" (Registrar Sudder Foudaree Adawlut to Captain Hervey, Assistant General Superintendent, No. 2050, dated 23rd August 1854); and I was requested by them to make over the case to the Magistrate of Belgaum, "who would try it under Act I. of 1849."*

28. Upon this, I reported to Government, through the Political Agent

Captain Hervey's reasons for remonstrating against the trial of the Bhar Robbers by an ordinary Court of Justice.

Southern Muratha Country, "that although the robbery effected at Goa might, when regarded *by itself*, be considered a *simple robbery*, I would beg to bring to notice that the gang, by a portion of

which that act was perpetrated, *numbered twenty-two men*. The whole at that time set out in small parties, in communication with each other, on one of their periodical expeditions, *intent on practising robbery by bhar*"; that in the course of the inquiry several other similar robberies had been elicited against the same gang, "*proving the men composing it to be professional and systematic robbers*"; that the chief person of the gang had declared to me, "that he had been thus systematically employed in his lawless pursuits, in different parts of the country, *for the last thirty-six years*" (he and some of his associates had occasionally even been tried by the Supreme Court of Judicature at Bombay), and "that the present might be perhaps a fair opportunity for checking the further progress in crime of such lawless persons." (Captain Hervey, Assistant General Superintendent, to J. D. Inverarity, Esq., Political Agent Southern Muratha Country, No. 122, dated 26th August 1854.)

29. This report was sent on to Government by the Political Agent Southern

Captain Hervey's views advocated by the Political Agent Southern Muratha Country.

Muratha Country, Mr. J. D. Inverarity, who viewed the crime in the same light as myself, with the following remarks.

* An Act to provide more effectually for the punishment of offences committed in Foreign States.

"3. It is for Government to decide whether a robbery of property, stated to amount to Rs. 7,500, committed by twenty-two persons, banded together for plunder, the chief of whom has admitted to Captain Hervey that for thirty-six years he has been thus systematically employed, can be denominated a simple robbery.

The Political Agent Southern Muratha Country to Mr. Secretary Anderson, No. 213, dated 28th August 1854, paragraphs 3 and 4.

If systematic and professional robbery is dacoity, then is the present a case of dacoity, accomplished, not by violence, but by deception and address.

"4. The translations of intercepted letters submitted by Captain Hervey show the strenuous endeavours which have been made from the beginning to thwart inquiry into the present case by the Dacoity Department, and I beg to record my opinion that but for the tact and experience which Captain Hervey has brought to bear upon the present case, the crime of bhar, as systematically practised by an extensive confederacy, would not have been thoroughly exposed."

30. In reply to this, Government observed that "it considered it advisable

The Government of Bombay direct a *via media*.

to withdraw as few cases as possible from the cognisance of the regular Courts, and that, therefore, it preferred that this case should be prepared by the Magisterial Authority, and be committed to the Sessions Court." "Being, however, at the same time, fully alive to the great assistance which may be derived from the Thuggee and Dacoity Department, His Lordship in Council directs that the Assistant General Superintendent conduct the prosecution in this case." (Mr. Secretary Anderson to the Political Agent Southern Muratha Country, No. 4278, dated 3rd October 1854.)

31. The case was thereupon, on my departure, in October 1854, for the Punjaub, to officiate as Superintendent for Major (now Lieutenant Colonel) Graham at Sealkote, handed over to the local Magistrate, by whose Acting First Assistant, Mr. C. Shaw, it was committed to the Dharwar Sessions, on a *charge of conspiracy*, each selected instance of the crime being sent up as a *separate case*, under Regulation XVII. of A. D. 1827 of the Bombay Code.

32. Eleven of the gang were tried accordingly, in such instances of robbery by bhar, viz :—

Tried	10
Admitted as Queen's evidence	3
Deceased before trial	1
At large.....	8

Total.... 22

33. The prisoners in seven of these instances were acquitted, *including for the robbery at Mhopsa, in the Goa Territory*; and but three prisoners (including, however, the great leader of the gang, Essajee Punt) were convicted,—one man in each of the three remaining instances,—and sentenced, viz. one man (Essajee Punt) to four years' imprisonment with hard labour, and a fine of Rs. 2,000, or, in default, to suffer further imprisonment for two years; another (Succaram Bhut) to two years' imprisonment with hard labour, and a fine of Rs. 500, in default whereof to suffer further imprisonment for two years. The sentence of the third man (Purrusram Gopinath) was, I believe, somewhat similar, but is unknown to me.*

34. It may be observed that, of the above three persons, *two*, named Essajee Punt and Purrusram Gopinath, had already before been similarly incarcerated for similar acts of crime, both by the Supreme Court of Judicature at Bombay, and by the Session Judge of Poona. Of the acquitted parties, too, four men had also before been imprisoned for the same crime. Thus six men out of the eleven that came into my custody, as above, *had previously been punished*; exemplifying how inadequate, under the operation of the existing laws, the award in such cases has been, as it must also be in the present instance, *for the repression of a people of such confirmed evil habits*.

35. These culprits were alluded to in paragraph 12 of my Report to the Bombay Government, No. 170, dated 11th September 1855, as follows:—

“12. The bhar robbers before mentioned were, at the request of the Judges of the Sudder Foujdaree Adawlut, and with the concurrence of Government, handed over to the Magistrate of Belgaum for committal to a Sessions Court, and it would be premature to offer any report regarding them until the result of their trials is known, except in this place merely to state that in *twenty-two authenticated instances of swindling, out of thirty-four in which the robberies were successful* (they having failed in sixteen other attempts), as elicited against them in my own proceedings, the property illegally acquired by them, by their impositions, *amounted in value to the extent of Rs. 59,578, of which Rs. 14,410 were in notes of the Bank of Bombay.*”†

36. On the conclusion of their trials, the Session Judge of Dharwar was pleased to declare that “he could not allow the result to be made known, without recording his opinion that Captain Hervey deserved the greatest

Remarks of the Trying Authority, on the part this Agency took in exposing the crime of Robbery by Bhar.

* It has been communicated since this Report was closed; and is the same as awarded to the man Essajee Punt.

† This was an error; the bank notes robbed having amounted to about Rs. 25,000, of which Rs. 14,410 were traced.

(Signed) C. HERVEY.

credit for his exertions in bringing these cases to light, and in tracing them in the manner he has done ; and that it was to be hoped that the publicity thus thrown on the operations of these gangs would put a stop to their depredations for the future, or, at any rate, put people on their guard, and encourage them to come forward at once with their evidence in case any attempts of the kind should be made." (Extract from the proceedings of A. Jones, Esq., Session Judge of the Zilla of Dharwar, in the bhar conspiracy cases, dated 19th December 1855.)

37. I have entered thus fully into the above system of crime, with a hope

A Special Law advocated for the suppression of Robbery by Bhar.

that it may be more prominently noticed elsewhere, and considered whether the deeds of such practised robbers should not, as advocated also by the

Political Agent Southern Muratha Country, in his report quoted under paragraph 29, be met by some more stringent laws than the Regulation under which only it would seem that they can readily be tried ; and whether they might not even be recognised under the provisions of Act XI. of 1848,* according to which more weight might be attached to the *evidence of accomplices, than which, in such confederacies, there is seldom any better to be obtained.* Aware, as these cautious swindlers are, what in our courts of law would under ordinary circumstances be sufficient for their conviction,—for the greatest

The reluctance of persons plundered by Bhar to give evidence against the Robbers.

drawback to any general combination for their suppression is the extreme reluctance with which the duped parties come forward with their evidence

against the delinquents,—it was with the greatest difficulty that I could persuade the Raja of Akolkote to admit that he had been successfully practised upon by them ; and in the instance of a man at Alibagh,† who was swindled by these adepts at crime of a quantity of notes of the Bank of Bombay, to the value of about Rs. 25,000, the entry of Rs. 14,410 whereof I had even traced to the ledger of a Sowkar of the city of Poona, to whom they had been disposed of by one of the gang, *I could not in any manner succeed in gaining the attendance of the plundered party.* He sent various excuses. At length, he proceeded to Bombay, out of my Magisterial jurisdiction. Summoned through the Chief Magistrate of the Island, he feigned sickness, and got himself admitted as a patient in the Jamsetjee Jejeebhoy Hospital, from which he put forth a sick certificate, and so altogether evaded giving his evidence.

(True extract)

(Signed) C. HERVEY, Captain,
Assistant General Superintendent.

* An Act for the punishment of wandering gangs of thieves and robbers.

† Both of these cases were tried, as above, in the Dharwar Sessions, and the prisoners in both were acquitted.

APPEN

STATEMENT of DACOIT APPROVERS, admitted by Captain C. commencement of his Operations against Professional Ducoits in 1847; exhibiting Gangs they belonged.

Number.	General No.	Name.	Caste.	Age.	Village.	Committing Officer.	To what Court Committed.
1	3265	Grassia Jemedar.	Sansiah Bhat.	60	No fixed residence.	Captain C. Hervey, Assistant General Superintendent.	The Sessions Court of Dharwar.
2	2254	Kokatee	Ditto ..	40	Ditto ..	Ditto	Ditto ..
3	None.	Kunkia Naik ..	Ditto ..	40	Ditto ..	Ditto	Ditto ..
4	None.	Ulfm	Ditto ..	35	Ditto ..	Ditto	Ditto ..
5	None.	Bhow	Ditto ..	70	Ditto ..	Ditto	Ditto ..
6	None.	Himtya	Ditto ..	65	Ditto ..	The Magistrate of Poona.	The Sessions Court of Poona.

DIX B.

HERVEY, *Assistant General Superintendent for the Bombay Territories, from the their several Sentences, the Number of Dacoities they have committed, and to what*

Date of Sentence.	How disposed of.	Total Number of Dacoities committed by each.	Belonging to what Gang.	Remarks.
In 1849, date unknown.	Transportation for life beyond seas.	60	Had his own gang.	Deceased of cholera, while on command duty in the Ahmednuggur Districts. The dacoity at Gokak, in the Southern Muratha Country, was the last of his series of crimes.
Ditto ..	Ditto ..	45	Grassia's.	Transferred to another Agency.
Ditto ..	Ditto ..	45	Had his own gang.	Ditto ditto. He was the leader of the dacoities at Bagulkote and Gudduk, in the Southern Muratha Country.
Ditto ..	Ditto ..	12	Kunkia's.	Transferred to another Agency.
Ditto ..	Ditto ..	60	Ditto ..	This man was not committed for trial by Captain Hervey, but was sent up to Jubbulpore for the purpose. He pointed out the spot where a quantity of the Bagulkote and other plunder had been buried. He was a veteran Dacoit, and had committed dacoity throughout every part of India, and often in the Southern Muratha Country, in Sir Thos. Munro's Camp. He had once formerly been in the custody of the Department somewhere in Upper India, but as he had become very ill, and the party in charge of him would not be burdened by him, they left him at a village, they thought, in a dying state. He slowly recovered, and, finding himself out of custody, he left that part of the country, and again came down to the Southern Muratha Country, in which, in Kunkia's gang, he took part in the dacoities at Aluilla and Bagulkote. He was finally seized, with some others of the tribe, in the Shorapoor Bedur province. He has been transferred to another Agency.
Unknown. . .	Five years' imprisonment with hard labour.	65	Tumholin's.	Deceased; he was the Karbarce of the woman Tumholin's gang. For the seizure of Tumholin a reward of Rs. 1,000 was offered, but she was never taken, and is still supposed to be living somewhere in the Oude Terraie.

Number.	General No.	Name.	Caste.	Age.	Village.	Committing Officer.	To what Court Committed.
7	None.	Risaldar	Sansiah Bhat.	25	No fixed residence.	Captain C. Hervey, Assistant General Superintendent.	The Sessions Court of Dharwar.
8	None.	Mussoo Naik ..	Ran Kaikaree.	35	Ditto ..	Ditto	Ditto ..
9	None.	Mushya	Ditto ..	25	Ditto ..	Ditto	Ditto ..
10	None.	Sutwa	Ditto ..	30	Ditto ..	Ditto	Ditto ..
11	None.	Jukkya	Ditto ..	30	Ditto ..	Ditto	Ditto ..
12	None.	Bablia	Ditto ..	22	Ditto ..	Ditto	Ditto ..
13	None.	Fucqueera ...	Ditto ..	25	Ditto ..	Ditto	Ditto ..
14	None.	Wenkia	Ditto ..	30	Ditto ..	Ditto	Ditto ..
15	None.	Sonea	Ditto ..	28	Ditto ..	Ditto	The Commissioner's Court of Sattara.
16	4771	Bappoo Naik ..	Ditto ..	55	Ditto ..	Ditto	Ditto ..
17	4792	Dadya	Ditto ..	30	Ditto ..	Ditto	Ditto ..
18	4897	Sunnia	Ditto ..	50	Ditto ..	Ditto	Ditto ..
19	4776	Bhecma	Ditto ..	27	Ditto ..	Ditto	Ditto ..

Date of Sentence.	How disposed of.	Total Number of Dacoities committed by each.	Belonging to what Gang.	Remarks.
Unknown. . .	Acquitted. .	8	Kunkia's.	This man was admitted as a probationary approver, and was sent on command to Khandeish, to seize a notorious Dacoit of the Kolliatec tribe, but he caused the arrest of the wrong man, and was sent up for trial by Captain Hervey, with the view to a capital conviction being passed upon him ; but he was acquitted by the Session Judge of Dharwar, from the custody of whose peons he effected his escape on his way to Belgaum, where he would have been again tried upon fresh charges. He proceeded at once to Jubbulpore, and there surrendered himself to the General Superintendent, by whom eventually he was admitted as an approver.
1st July 1850	Transportation for life beyond seas.	91	Poona ..	This man is now at Nagpore. He lately murdered his wife, and is likely to be hanged.*
Ditto ..	Ditto ..	68	Ditto ..	Transferred to another Agency.
Ditto ..	Ditto ..	47	Poona & Nuggur.	Ditto ditto.
Ditto ..	Ditto ..	61	Poona & Moghul-lai.	Ditto ditto.
Ditto ..	Ditto ..	23	Poona ..	Ditto ditto.
Ditto ..	Ditto ..	30	Ditto ..	Ditto ditto.
Ditto ..	Ditto ..	47	Poona & Nuggur.	Ditto ditto.
Ditto ..	Ditto ..	26	Ditto ..	Ditto ditto.
30th July 1851	Ditto ..	96	Sattara & Rutnagherry.	Ditto ditto.
Ditto ..	Ditto ..	53	Sholapore	Ditto ditto.
31st July 1851	Ditto ..	94	Poona ..	This man is now at Jubbulpore.
Ditto ..	Ditto ..	20	K h a n - deish & Konkun.	Ditto ditto.

* He has been transported for life.—(March 1858.)—C. II.

Number.	General No.	Name.	Caste.	Age.	Village.	Committing Officer.	To what Court Committed.
20	4850	Kurroo Naik ..	Ran Kaikaree..	65	No fixed residence.	Captain C. Hervey, Assistant General Superintendent.	The Commissioner's Court of Sattara.
21	4896	Soorya Naik ..	Ditto ..	35	Ditto ..	Ditto	Ditto ..
22	4773	Bendya	Ditto ..	28	Ditto ..	Ditto	Sessions Court of Dharwar.
23	4881	Possia	Ditto ..	18	Ditto ..	Ditto	Ditto ..
24	4936	Yellia Kongaria..	Ditto ..	15	Ditto ..	Ditto	Ditto ..
25	4781	Bheemshya	Ditto ..	35	Ditto ..	Ditto	Ditto ..
26	4863	Moria	Ditto ..	50	Ditto ..	Ditto	Ditto ..
27	None.	Sutwa 3rd	Ditto ..	20	Ditto ..	Ditto	Ditto ..
28	None.	Mullaree	Ditto ..	22	Ditto ..	Ditto	Ditto ..
29	4900	Sutwa 2nd	Kulkorwee ..	30	Ditto ..	Ditto	Ditto ..
30	None.	Nagia Naik	Ditto ..	50	Ditto ..	Ditto	Ditto ..
31	None.	Burria Naik ...	Ditto ..	55	Ditto ..	Ditto	Ditto ..
32	None.	Sunjwa Naik ..	Ditto ..	55	Ditto ..	Ditto	Ditto ..
33	5713	Ramgirree Tool- jia Naik.	Ditto ..	40	Ditto ..	Ditto	Ditto ..
34	5747	Kullolia Naik ..	Ditto ..	25	Ditto ..	Ditto	Ditto ..
35	5738	Kurree Sahibya..	Ditto ..	40	Ditto ..	Ditto	Ditto ..

* This approver escaped from custody in November 1855, and then committed several robberies, and the deal of trouble.—C. II.

Date of Sentence.	How disposed of.	Total Number of Dacoities committed by each.	Belonging to what Gang.	Remarks.
1st July 1851	Transportation for life beyond seas.	114	Sattara .	This man is now at Nagpore.
Ditto ..	Ditto ..	52	Ditto .	Is with Captain Hervey.
Ditto ..	Ditto ..	44	Poona ..	Transferred to another Agency.
Ditto ..	Ditto ..	15	Poona & Konkun.	Is with Captain Hervey.
Ditto ..	Ditto ..	68	Sholapore	["Kongaria" for his quarrelsome disposition. Transferred to another Agency. He was nick-named
Ditto .	Ditto ..	85	Ditto ..	Is with Captain Hervey.
12th Nov. 1851	Ditto ..	69	Poona. . .	Ditto ditto.
26th Dec. 1851	Ditto ..	10	Ditto ..	Transferred to another Agency.
Ditto ..	Ditto ..	10	Ditto ..	Ditto ditto.
22nd June 1852	Ditto ..	Un-known.	Ditto ..	Ditto. He is somewhat mad, and was a very bold Dacoit. His narrative was not taken. He once rushed into the full Court of the Session Judge at Poona, mounted on a poney, to the dismay of the crowd of Karkoons, &c.
10th Feb. 1853	Ditto ..	11	Dharwar.	Is with Captam Hervey; he has committed also several burglaries. His parents were Murathas, but he became a Korwee, and a noted leader of Dacoits.
Ditto ..	Ditto ..	17	Ditto ..	Escaped; he has committed besides innumerable burglaries, according to his own account as "numbless as the hairs of his head." He was in the habit, from the age of sixteen or seventeen up to arrest in 1852, of committing five or six burglaries during the dark half of every month.*
Ditto ..	Ditto ..	18	Ditto & Bellary.	Decensed; was also a burglar. He was a very cunning man, and had but one eye.
Ditto ..	Ditto ..	8	Dharwar..	Is with Captain Hervey; his burglaries also are numerous.
Ditto ..	Ditto ..	12	Ditto ..	Transferred to another Agency; also a great burglar.
7th February 1853.	Ditto ..	22	Ditto ..	Is with Captain Hervey; this man also a burglar. He was nick-named "Kurree" for being very black.

murder of a fellow Dacoit. He was recently (January 1858) again captured by some of my people, after a

Number.	General No.	Name.	Caste.	Age.	Village.	Committing Officer.	To what Court Committed.
36	5760	Gidboolla	Kulkorwee . .	55	No fixed residence.	Captain C. Hervey, Assistant General Superintendent.	The Sessions Court of Dharwar.
37	5736	Nursia	Ditto . .	38	Ditto . .	Ditto	Ditto . .
38	5744	Hooglia	Ditto . .	33	Ditto . .	Ditto	Ditto . .
39	5748	Dod Sahibya Naik	Ditto . .	75	Ditto . .	Ditto	Ditto . .
40	None	Runga Naik. . . .	Ditto . .	40	Ditto . .	Ditto	Ditto . .
41	None	Mudgia	Ditto . .	50	Ditto . .	Ditto	Ditto . .
42	1976	Gid Bhowance . .	Ran Kaikaree.	38	Ditto . .	Ditto	Ditto . .
43	5661	Ekankee Kulloria	Kaikaree . .	22	Ditto . .	Ditto	Ditto . .
44	None	Kurta Sutwa. . . .	Ditto . .	28	Ditto . .	Ditto	Ditto . .
45	5709	Bher Tookya . .	Ditto . .	28	Ditto . .	Ditto	Ditto . .
46	5737	Dolmookh Yella.	Kulkorwee . .	50	Ditto . .	Ditto	Ditto . .
47	5764	Purwa	Ditto . .	30	Ditto . .	Ditto	The Political Criminal Court of Belgaum.
48	None	Galkut Bhowance	Kaikaree . .	38	Ditto . .	Ditto	Ditto . .
49	1225	Shorapoorree Kullolia Naik.	Ditto . .	40	Ditto . .	Ditto	Ditto . .

Date of Sentence.	How disposed of.	Total Number of Dacoities committed by each.	Belonging to what Gang.	Remarks.
10th Feb. 1853	Transportation for life beyond seas.	5	Dharwar.	Transferred to another Agency ; is also a burglar.
Ditto ..	Ditto ..	8	Dharwar & Bel-lary.	Is with Captain Hervey ; he has committed also several burglaries, and was associated with Waddur Dacoits.
Ditto ..	Ditto ..	7	Ditto ..	Transferred to another Agency ; is also a burglar.
Ditto ..	Ditto ..	12	Badamee.	Ditto. This man is a very aged Dacoit, who long had his colony on the Badamee frontier. He used often, he says, to be consulted by the District Authorities when any crime took place, and which generally was the deed of his own men. He has been a great burglar also.
Ditto ..	Ditto ..	7	Ditto ..	Transferred to another Agency ; is also a burglar.
Ditto ..	Ditto ..	8	Ditto ..	Ditto ditto ditto.
26th January 1853.	Ditto ..	33	Sholapore Poona, & Kon-kun&c.	Is with Captain Hervey. This Dacoit is a very little man, and was ubiquitous. He changed from one gang to another, never joining any, unless the leader would consent to give him <i>a half share more than to an ordinary member</i> , for he was a very intelligent Dacoit. His evidence is consequently most useful, from his having been engaged under so many different leaders.
Ditto ..	Ditto ..	7	Sholapore & Moghullai.	Transferred to another Agency ; was also a burglar. He was called Ekankee for having but one eye.*
27th Jan. 1853.	Ditto ..	12	Sholapore	[burglaries. Is with Captain Hervey ; has also committed some
Ditto ..	Ditto ..	15	Ditto ..	Transferred to another Agency ; was also a burglar.
17th February 1853.	Ditto ..	20	Badamee & Dharwar.	} Are with Captain Hervey. They were burglars, and belonged to Dod Salubya's colony near Badamee. "Dohmookh" was so nick-named for his having a long face.
27th June 1853.	Ditto ..	17	Ditto ..	
31st August 1853.	Ditto ..	75	Sholapore & Moghullai.	Transferred to another Agency. He is called <i>Galkut</i> , from having a deep slash across his cheek, received in dacoity ; was also a burglar.
Ditto ..	Ditto ..	21	Ditto ..	Transferred to another Agency ; he was also a noted burglar.

* This man has lately been transported for incest.—(March 1858).—C. H.

Number.	General No.	Names.	Caste.	Age.	Village.	Committing Officer.	To what Court Committed.
50	None.	Anyaba	Mhang Rukh-waldar.	40	Bondree, Sattara.	Captain C. Hervey, Assistant General Superintendent.	The Political Criminal Court of Belgaum.
51	..	Rauoo	Ditto ..	32	Mandwee, Sattara.	Ditto	Ditto ..
52	1891	Sollah Sutwa ..	Ran Kaikaree.	36	No fixed residence.	Ditto	Ditto ..
53	1814	Hummunta Naik.	Ditto ..	50	Ditto ..	Ditto	Ditto ..
54	1873	Dongta Jemadar.	Ditto ..	75	Ditto ..	Ditto	Ditto ..
55	1877	Yessoo Naik ..	Ditto ..	39	Ditto ..	Ditto	Ditto ..
56	None.	Malgeemunnee Bhema.	Kulkorwee ..	40	Ditto ..	Ditto	Ditto ..
57	5766	Pochkia	Ditto ..	35	Ditto ..	Ditto	Ditto ..
58	5684	Totug Nursia ..	Kaikaree ..	38	Ditto ..	Ditto	Ditto ..
59	5767	Chunnia Naik ..	Kulkorwee ..	40	Ditto ..	Ditto	Ditto ..
60	5768	Sunnia Naik ..	Ditto ..	30	Ditto ..	Ditto	Ditto ..
61	None.	Yersooska Naik.	Mhang ..	30	Ditto ..	Ditto	Ditto ..
62	None.	Andoo Naik ..	Mhang ..	55	Soorlee, Sattara.	Ditto	Ditto ..

Date of Sentence.	How disposed of.	Total Number of Dacoities committed by each.	Belonging to what Gang.	Remarks.
17th February 1851.	Transportation for life beyond seas.	19	Sattara . .	Is with Captain Hervey ; he was a village watchman.
Ditto ..	Ditto ..	31	Ditto ..	Transferred to another Agency ; also a village watchman.
28th February 1851.	Ditto ..	82	Khandeish & Poona.	Transferred to Indore ; he has occasionally committed dacoity in the gangs of Kolhatee and Bhut Dacoits.
Ditto ..	Ditto ..	62	Poona & Konkun.	Is with Captain Hervey.
Ditto ..	Ditto ..	133	Ditto ..	Is with Captain Hervey ; he is an aged Dacoit, and the Northern Konkun used to be his peculiar " preserve," in which he committed the most of his dacoities.
18th February 1851.	Ditto ..	105	Ditto ..	Is with Captain Hervey ; this Dacoit is a perfect Apollo.
1th May 1854	Ditto ..	10	Badamee and Moghullai.	After being sent up to undergo the usual trial, this man recanted ; but he was convicted, and sentenced to life transportation, which Government commuted to imprisonment with hard labour for five years, which he is now undergoing. He belonged to the Badamee colony, and was a very bold burglar, and in great repute among the tribe.
13th July 1851	Ditto ..	13	Canara . .	Is with Captain Hervey ; was also a burglar.
29th August 1851.	Ditto ..	42	Sholapore and Moghullai.	Transferred to another Agency ; was also a burglar.
22nd September 1854.	Ditto ..	28	Bellary & Dharwar.	Ditto. He was both Dacoit and burglar.
Ditto ..	Ditto ..	29	Ditto ..	Is with Captain Hervey ; he is a son of the old approver Dod Sahibya, and was also a burglar.
29th ditto ..	Ditto ..	14	Bellary, Badamee & Canara.	Is with Capain Hervey ; he was sentenced to life transportation, but Government commuted the sentence to seven years' imprisonment with hard labour. He has committed dacoity in the Bellary and Dharwar districts, and also under the old approver Dod Sahibya ; he has committed several burglaries.
17th January 1855.	Ditto ..	16	Sattara.	Is with Captain Hervey ; he was a village watchman, or Jaglia.

Number.	General No.	Names.	Caste.	Age.	Village.	Committing Officer.	To what Court Committed.
63	None.	Andia	Mhang ..	36	Telangsee, Nuggur.	Captain C. Hervey, Assistant General Superintendent.	The Political Criminal Court of Belgaum.
64	None.	Namia	Ran Kaikaree.	35	Digolee, Nuggur.	Ditto	Ditto ..
65	None.	Raojee	Ditto ..	30	No fixed residence.	The Magistrate of Surat.	The Sessions Court of Surat.
66	None.	Dhasa	Ditto ..	50	Ditto ..	The Commissioner of Sattara.	The Commissioner's Court of Sattara.
67	1876	Pochkia Naik .	Ditto ..	40	Ditto ..	Ditto	Ditto ..
68	1917	Timma.....	Ditto ..	30	Ditto ..	Ditto	Ditto ..
69	None.	Bheema	Kaikaree	28	Ditto ..	The Magistrate of Sholapore.	The Sessions Court of Sholapore.
70	None.	Purrakurmee Naik.	Ditto ..	15	Ditto ..	Ditto	Ditto ..
71	5687	Nad Tookya Naik.	Ditto ..	48	Ditto ..	Ditto	Ditto ..

Date of Sentence.	How disposed of.	Total number of Dacoities committed by each.	Belonging to what Gang.	Remarks.
21st September 1855.	Transportation for life beyond seas.	12	Nuggur & Moghul-lai.	Is with Captain Hervey; he was a Jaglia in the Ahmednuggur Zilla, and used also sometimes to commit burglary.
Ditto ..	Ditto ..	23	Ditto ..	Deceased; he was also a village Jaglia, and a burglar.
Unknown	Seven years' imprisonment with hard labour.	18	Konkum & Poona.	Is at Jubbulpore. He was the first Kaikaree Dacoit who became an approver. He was seized while taking part in a dacoity at Bulsar (Surat), in the old man Oongta Naik's gang, and was sentenced to seven years' imprisonment, which had not expired when he was transferred to Jubbulpore.
Ditto ..	Three years' imprisonment with hard labour.	36	Moghul-lai, Khan-deish, and Sattara.	Transferred to another Agency. He also was seized in the act of a dacoity, in the Sattara State, in which he was severely wounded and hacked. He was transferred to Jubbulpore before the expiration of his sentence. Dhasa had also committed some burglaries.
Ditto ..	Ditto ..	Un-known.	Poona ..	This man escaped before trial. He did not wish to be called upon to give evidence against his brother, who was among the prisoners at that time in custody. He is supposed to be now a Peon somewhere.
Ditto ..	Ditto ..	63	Ditto ..	Transferred to another Agency. After conviction and sentence to life transportation, he was by the Judges of the Sudder Foujdaree Adawlut released, but on again coming into the custody of the Department, he confessed, and was admitted as an approver. He was sent up for final trial to Jubbulpore.
Ditto ..	Five years' imprisonment with hard labour.	27	Sholapore	Transferred to another Agency. He and his brother had been released by Captain Hervey for want of evidence; but they soon after took part in a dacoity in the Sholapore Zilla, in which <i>his brother was killed, and he wounded and arrested. Before his release, he had committed as many as twenty-six dacoities</i> , which was not known at the time, as there were no approvers who had done anything with him.
Ditto ..	Transportation for life beyond seas.	23	Sholapore & Moghullai.	Transferred to Hyderabad. He was a celebrated Naik, and was already under sentence of life transportation when he was transferred to Captain Hervey. He has often robbed in the Cantonments at Sholapore. Purrakurmee was also a very successful house-breaker.
Ditto ..	Five years' imprisonment with hard labour.	39	Ditto ..	Is with Captain Hervey. He is a notorious leader, and resided for a long period at the village Nad, in the Indee Talooka of the Sholapore Zilla. When transferred to this Agency, he was already under a sentence of imprisonment with hard labour for five years, for a burglary at Salotgee, in which one

Number.	General No.	Names.	Caste.	Age.	Village.	Committing Officer.	To what Court Committed.
72	5681	Jamgar Tooljia Naik.	Kaikaree	65	No fixed residence.	The Magistrate of Sholapore.	The Sessions Court of Sholapore.

*Assistant General Superintendent's Office,
Coorla, 1st April 1856.*

Date of Sentence.	How disposed of.	Total Number of Dacoities committed by each.	Belonging to what Gang.	Remarks.
Unknown ..	Seven years' imprisonment with hard labour.	31	Sholapore	<p>of his sons was killed. His final trial will take place upon the expiration of the above sentence. Nad Tookya used also, occasionally, to commit burglaries.</p> <p>Transferred to another Agency. When sent to this Department, he was already under a sentence of imprisonment with hard labour for seven years, on account of a burglary at Sindagee, the period of which has not yet expired. He was a celebrated character among Dacoits, and was once in custody at Dharwar, in the time of Mr. Baber, for a dacoity at Gungawuttee, but was acquitted. This man was a very expert burglar.</p>

(Signed) C. HERVEY, Captain,
Assistant General Superintendent.

APPEN

*STATEMENT of SIXTY-SIX out of One Thousand and Forty-eight
PRESIDENCY by the Poona, Konkan,*

Number.	Date.	Where Committed.		
		Village.	Talooka.	Zilla.
1	13th August 1834	Gohagur	Anjunwell	Rutnagherry....
2	6th December 1845 ..	Kaseegaum	Kurar	Sattara
3	27th November 1845 ..	Kurdeh	Punderpoor....	Sattara
4	13th September 1847 ..	Sirgaum	Wace	Sattara
5	13th May 1847	Bulsar	Bulsar	Surat.....
6	22nd April 1847.....	Nursingpoor	Kurar	Sattara
7	30th November 1848 ..	Nursingpoor	Indapoor	Poona
8	1841.....	Bhewndy.....	Bhewndy	Tanna
9	18th April 1844	Dhoolia	Dhoolia	Dhoolia.....
10	9th July 1848	Ghorebunder	Shastee.....	Tanna
11	10th March 1848.....	Sacegaum.....	Wage	Sattara
12	14th November 1847 ..	Chinchnee	Uthnee.....	Belgaum
13	1st October 1848	Uthnee.....	Uthnee.....	Belgaum
14	10th August 1848	Patkolce	Mohole	Sholapore
15	2nd May 1846	Chinchnee Tarapoor.	Suzzan.....	Tanna
16	4th January 1846....	At the Sungum at Poona.	Huwlee	Poona

DIX C.

DACOITIES committed in the Territories under the BOMBAY Sholapore, Badamee, Dharwar, and Hindoostan Gangs.

On whose House.	Strength of the Gang.	Killed.	Wounded.	Amount of Property taken.			Amount recovered.			Remarks.
				Rs.	a.	p.	Rs.	a.	p.	
Bappoo Rugoonath Oké.	11	..	..	14,545	12	0	.....		
Dhondoo Suddasew Koolkurnee.	15	..	..	1,998	6	0	250	0	0	
Eswunt Wittul Koolkurnee.	13	..	..	4,462	0	0	.....		
Balcris Purshotum Koolkurnee.	21	..	..	4,000	0	0	.....		
Abbaram Jogee, and Nundram Muccundass.	24	..	..	6,152	12	0	101	13	4	
Abba Maharaj, and Anna Maharaj.	17	..	1	.....			.....			The dacoity was an unsuccessful one.
Dajce Annunt Dhigre.	15	1	..	139	8	0	.....			The killed party was a Dacoit.
Ram Bhew Buchajee.	16	..	..	2,519	4	0	.....		
Bulwuntrao Konair, Sheristedar of the Magistrate's Office.	18	..	1	2,963	8	0	5	5	1	
Dhond Josee bin Bal Josee.	11	..	..	1,385	8	0	.....		
Venayek Suddasew Apté.	22	..	..	4,725	8	0	.....		
Jugonnath Junardhun Indoleekur.	15	..	..	5,423	14	0	.....		
Dadajee Chowndo Tuggaree.	16	..	..	874	5	9	.....			Some villagers were sentenced for this robbery.
Dada Bhut bin Appa Bhut Josee, and Atmaram Krishna.	14	..	1	900	6	0	100	0	0	
Munnohur Nuthoosett Sahooakar.	17	..	..	7,807	0	0	.....		
Upon the Bungalow of the late Capt. Hart.	13	..	..	250	0	0	.....		

Number.	Date.	Where Committed.		
		Village.	Talooka.	Zilla.
17	Date unknown; about fifteen years ago.	Dapooree, near Poona.	Huwelee	Poona
18	20th June 1846	Bandora	Shastee	Tanna
19	3rd March 1846.....	Oorun or Caranjah..	Caranjah	Tanna
20	2nd January 1849 ..	Mahableschwur.....	Jowlee	Sattara
21	12th May 1837	Senale, near Nirmul..	Bassein	Tanna
22	9th December 1847 ..	Kulledhone	Khanapoor	Sattara
23	20th September 1844 ..	Jeo	Shastee	Tanna
24	30th June or 1st July 1848.	Shelgee	Sholapore.....	Sholapore
25	In June or July 1841 ..	Malsirrus.....	Poorundhur....	Poona
26	8th March 1848.....	Mungloor	Akulkote.....	Sholapore
27	28th September 1846 .	Lalsingee.....	Indee	Sholapore
28	3rd November 1850 ..	Singnapoor	Indee	Sholapore
29	29th June 1840	Chand Kowta	Hypurga	Sholapore
30	29th or 30th June 1839.	Boodehall, near Kamunkerree.	Mungolee.....	Sholapore

On whose House.	Strength of the Gang.	Killed.	Wounded.	Amount of Property taken.	Amount recovered.	Remarks.
				Rs. a. p.	Rs. a. p.	
Hureechund Purboo.	23	..	..	Unknown.	Unknown.	Unknown, because the plundered party has left the village. The residence of the Governor of Bombay is at Dapooree.
Antone, son of Manoel Souza.	13	..	..	160 0 0	.....	Bandora Hill, close to Bombay.
Hurreepansett Sonar.	12	..	..	3,550 4 0	.....	The island of Caranjah, in the Bombay Harbour.
Sectaram Prubhakur Despandeh.	18	..	..	395 8 0	30 0 0	There were two dacoities on the Mahableshwur Hills, besides others at Nagotna, Mhar, Poladpoor, and Parr, &c. on the road to them from Bombay.
Rungo Pandoorung Gosaec, and Nurbhiram Wullubram.	8	..	..	409 0 0	.....
Puncho bin Mahadoo Wanee.	16	..	..	2,397 4 6	2,192 4 6	The gang was seized, and one of them, who was severely mauled on the occasion, since became an approver; his name is Dhasa.
Pandoorung Huree ..	13	..	..	307 0 0	.....
Seolingappa bin Burappa.	14	2	4	98 6 0	.....	The residence of the Criminal Judge of the Civil and Military Station of Sholapore is close to Shelgee.
Ramchunder Bappoojee, Bhyrao Myhiput, and Succaram Huree Bowsee.	17	..	..	Unknown.	Unknown.	The plundered parties have left the village.
Eruppa bin Mullappa Kostee.	19	..	2	159 8 0	.....
Khund Bhut bin Jeevun Bhut Joesee.	19	2	2	107 0 0	.....
Mortuppa bin Satuppa Patel.	12	1	2	56 8 0	0 3 1	
Upon the house of Chumbussawa woman.	30	1	1	1,024 2 0	.....	The dacoity was especially undertaken for the murder of the woman, which was effected.
Kurree Bussappa wulud Mahadeo Appa Jungum.	29	1	1	100 0 0	.....

Number.	Date.	Where Committed.		
		Village.	Talooka.	Zilla.
31	30th December 1837 ..	Beejapoor	Beejapoor	Sattara
32	Date unknown, about twenty years ago.	Allullee	Hypurga	Sholapore
33	22nd April 1841	Sirshyal	Indee	Sholapore
34	11th July 1847	Chincholee	Akulkote	Sholapore
35	31st October 1853	Chickhullee	Akulkote	Sholapore
36	23rd March 1854	Munnoor	Mungolee	Sholapore
37	In 1845 or 1846	Luchan	Sanglee	Belgaum
38	Date unknown ; year 1840.	Bumnullee	Indee	Sholapore
39	28th February 1851 ..	Opin-Butgirree	Dharwar	Dharwar
40	23rd October 1849	Kullowlee	Beeree	Belgaum
41	2nd September 1848 ..	Yemkunmurdee	Chikoree	Belgaum
42	Date unknown ; year 1846.	Moolgoond 3rd	Dumbul	Dharwar
43	20th October 1846....	New Hooblee	Hooblee	Dharwar
44	18th September 1846.,	Addurkuttee, near Muzlapoor.	Sanglee	Belgaum
45	2nd September 1853 ..	Ergoontee	Roydroog	Bellary

On whose House.	Strength of the Gang.	Killed.	Wounded.	Amount of Property taken.	Amount recovered.	Remarks.
				Rs. a. p.	Rs. a. p.	
Wirroo Paxapa wulud Scolingappa, and Sunkurappa wulud Rachappa Bungar.	18	.. ..		380 2 0	.....
Nagappa wulud Saibya Hujjam.	13	.. ..		Unknown.	Unknown.	The plundered party is dead.
Krishnajee Mahadeo, and Balcris Wassoodeo, Revenue Survey Karkoons.	11	.. ..		238 10 0	5 0 0	The dacoity was undertaken at the instance of the Patel of Sirshyal, who wanted certain papers in the possession of the Revenue Survey Karkoons, and which he succeeded in getting accordingly.
Suddasew Dhurmajee, Koolkurnee.	17	.. 3		193 4 0	.....
Dhondee bin Dajee, Durzee.	12	1 2		424 8 6	.....
Mullappa wulud Mullappa Joolae.	13	1 ..		35 14 9	.....
Upon the threshing-floor of Mulkappa Punchum Lingayut, &c.	14	1 1		10 0 0	.....	This was perpetrated by moonlight, as all dacoities in the open country, upon fields & threshing-floors, invariably are.
Roodrappa Jeer Ankuljee.	15	.. ..		Unknown.	Unknown.	The plundered party is dead.
Upon the shops of Adrisappa bin Mullappa Hoollee, and Rewappa bin Goorsidappa Wanec.	31	.. ..		12,387 0 0	.....	This was the deed of Kulkorwees of the Dharwar Zilla, joined by some of the Village Police, and the Kotwal of Dharwar was also in some way implicated in it.
Bheemrao Ramchunder, Karkoon.	29	.. ..		730 1 6	8 12 0	
Sidrana bin Rewappa Tellee.	16	.. ..		227 14 5	.....	For this and the preceding dacoity at Kullowlee, some villagers were punished.
Mullkar Joonappa bin Humpya Busreemurd.	42	.. 1		.....	.....	Unsuccessful. There were three dacoities at Moolgoond, the deed of the same robbers.
Fukeerappa Munsee-kaec.	65	.. ..		2,526 0 0	.....	The house was a very strong one, and the owner a person of great substance, and therefore the gang was a large one.
Goorrow Timmajee, Koolkurnee.	56	1 2		400 0 0	.....
Bheemappa Komtee.	35	.. 3		806 11 0	.....

Number.	Date.	Where Committed.		
		Village.	Talooka.	Zilla.
46	14th March 1844	Moolgoond 1st.....	Dumbul	Dharwar
47	12th December 1844 ..	Gooledgood	Badamee	Belgaum
48	22nd February 1830 ..	Welneshwur	Anjunwell	Rutnagherry...
49	In 1830	Rhymutpoor	Kooreygaum .	Sattara
50	24th February 1832 ..	Cantonment of Sholapore.	Sholapore.....	Sholapore
51	11th February 1836 ..	Barsee	Barsee	Sholapore
52	18th April 1841	Barsee	Barsee	Sholapore
53	26th November 1842 ..	Poona	Huwclee	Poona
54	26th June 1845	Almilla.....	Hypurga	Sholapore
55	30th June 1845	Sholapore	Sholapore	Sholapore
56	22nd February 1846 ..	Gokak	Gokak	Belgaum
57	21st April 1835	Meeruj.....	Meeruj.....	Belgaum
58	22nd February 1831 ..	Dhoolia	Dhoolia	Khandeish.....
59	Date unknown; about twenty-three years ago.	Nundgur	Beeree	Belgaum
60	Date unknown; about thirty-two years ago.	Nepanee	Chikoree	Belgaum
61	Date unknown; about thirty-one years ago.	Dhoonsee.....	Hooble	Dharwar
62	27th November 1845 ..	Bagulkote	Bagulkote	Belgaum
63	13th April 1847	Gudduk	Gudduk	Dharwar

On whose House.	Strength of the Gang.	Killed.	Wounded.	Amount of Property taken.	Amount recovered.	Remarks.
				Rs. a. p.	Rs. a. p.	
Meerappa bin Kurribussappa Yelwuttee.	20	Unknown.	Unknown.	The plundered party is not now at the village.
Seolingappa bin Ninnappa, and Chunnunna bin Sidappa.	31	..	..	493 9 0	.....
Govind Ragho Bullal Gokulleh.	23	1,173 9 0	The gang consisted of MhangRukhawaklars of the Sattara country.
Kassee Ramchunder Salpootee, and Bappoo Ramjee Jain.	75	220	to 30	3,000 0 0	.....
Upon the Treasury of the Military Paymaster.	16	1	2	No booty. This and the succeeding robberies up to No. 63 were committed by Bhat or Sansiah Dacoits from Hindoo-stan.
Kooshaldass Goozur.	32	4	3	5,455 4 4	Two of the Dacoits were seized, but one, on pretending to be a villager, was released, and the other was sentenced to five years'. He became an approver (Hintya).
Bhuggoo Korea bin Appajee Korea.	24	6	4	5,541 0 0	.....
Kheta Moolchund, Marwaree.	28	..	..	5,000 0 0	.....
Lingowa kom Siddappa.	8	1	5	1,411 6 0	No booty.
Hurreechund Purumchund, Goozur.	27	3	6	2,522 0 0	.....
Dhondappa Naik Kuddulgekur.	21	5	5	1,038 6 0	.....
Sunker Naik Jewajee Nurgoondcekur.	28	1	3	5,700 0 0	.....
Upon the Company's Treasury.	25	3	2	.....	.....
Kallappa Surreekur.	26	3	1	5,000 0 0	.....
Upon the shop of Sherrychund Marwaree, in the Camp Bazar of Sir T. Munro.	20	1	1	7,000 0 0	.....
Upon the Chowree...	26	3	6	1,100 0 0	.....
Jugonnathdass Sa-hookar.	11	3	4	9,000 0 0	.....
Wassappa bin Venketdass, Goozur.	20	3	2	657 0 0	.....

Number.	Date.	Where Committed.		
		Village.	Talooka.	Zilla.
64	In 1840 or 1841	Kellee Mahim, near Bombay.	Mahim.....	Tanna'
65	Date unknown.....	Ugsee	Goa	Goa
66	In 1844	Mungolee.....	Mungolee.....	Sholapore

*Assistant General Superintendent's Office, Coorla,
1st April 1846.*

On whose House.	Strength of the Gang.	Killed.	Wounded.	Amount of Property taken.	Amount recovered.	Remarks.
				Rs. a. p.	Rs. a. p.	
Upon a Brahmin's house.	10	..	..	.....	.....	The Dacoits got no booty.
Upon a Sonar's house.	8	..	2	30 0 0	.....
In the Camp of some Troops marching from Bellary to Sholapore.	9	..	..	125 0 0	.....

(Signed) C. HERVEY, Captain,
Assistant General Superintendent.

N.B.—In these sixty-six gang robberies, the total number of Dacoits actually engaged amounted to 664; of whom—

Is under investigation	1
Have died	100
Have been transported for life, or sentenced to limited imprisonment with hard labour.....	222
Have been admitted as approvers	67
Are at large (including 31 released)	274
Total.....	664

(Signed) C. HERVEY.

APPENDIX D.

REMARKS ON DACOITY No. 1.

This was committed by a gang of eleven Dacoits upon the house of a person related to the late Bajeerao. It was a very large house, and at the 'deoree' door (or door leading into the yard of the premises) was a guard of four or five able-bodied men (all asleep), armed with swords, shields, and matchlocks. The owner of the house was among them. The Dacoits first took away their weapons, and then secured them by tying up their arms behind them. With hatchets and with stones they next tried to break open the door of the house, but without effect. They then threatened to murder the owner of the house, whereupon he called to his wife to open the door, and then he desired them to take all they could, but not to kill any one. The house was full of wealth ; but, owing to the small number of the gang, the Dacoits could carry off a booty to the value, they said, of *only* Rs. 14,545-12-0, consisting of gold and silver ornaments. The villagers pursued the robbers, but seized no one. On the following day, however, a man of the tribe was seized for this robbery, and subsequently four others. Three were sentenced to five years' imprisonment with hard labour ; but only one of them had taken part in the dacoity.*

Seven men of this gang, including three approvers, have been sentenced to life transportation through this Agency ; three are dead ; and the eleventh, now a very old man, was lately released after undergoing a limited punishment.

REMARKS ON DACOITY No. 2.

This was a dacoity upon the house of the village Koolkurnee, now a Mam-lutdar. There happened not to be any frame to the village gate, so that one of the Dacoits contrived, by digging away the earth a little, to pass his body through the aperture at the bottom of the door. He then removed the fastening of the gate inside, and let his associates into the village. They

* N.B.—Where stated, in the series of these remarks, that parties were seized, punished, or released, such seizures were by the *local Police* ; but the results of the *final* proceedings against the several gangs, as exhibited at the foot of each case, were from the subsequent arrests and committals on the part of this Office.—C. II.

proceeded in a body up to the doomed house ; a ladder was placed against a wall of it, by which means the yard was attained ; the door leading into the yard was then opened, and, after all had come in, they forced their entrance into the house. Their booty was to the value of Rs. 700* (or Rs. 1,998-6-0 according to the Koolkurnee's account). They escaped.

But as the gang happened very early one morning, about twelve or thirteen days subsequently, to be passing by the village of Khurdee, near Punderpoor, on their way back to Poona, they were seized by the Koolkurnee of that place, upon whose house a dacoity had but a few nights previously been committed by one of the Sholapore gangs from the other side of the Bheema. The Koolkurnee searched the robbers, and, on finding in their possession the articles they had plundered at Kaseegaum, he declared the same to be a part of what had been stolen from him, so he forced the robbers to disgorge it all to him, and a sum of Rs. 500 besides ! He then released them. He even managed to get an award in his favour accordingly from the Sattara Durbar ; but his conduct was found to be so reprehensible, when the circumstances attending this dacoity, and that upon his house at Khurdee, were investigated in this Office, and his endeavours to qualify his evidence so palpable,—which, if not discovered, might have led to the acquittal of both gangs, his effort being to prove that the Kaseegaum gang, and not the other, were the culprits,—that I was obliged to report him to Government, who deprived him of his Koolkurnee holding.

Strength of the gang, Kaikarees and Ramoosees	15
Approver under sentence of life transportation	1
Transported for life	8
Deceased	1
Under investigation	1
At large, belonging to the Ramoosee tribe	4
	<hr/>
	Total.... 15

REMARKS ON DACOITY No. 3.

This was upon the house of two brothers, who were the Koolkurnees of the village ; according to whom, the loss they sustained amounted to Rs. 4,462, but according to the Dacoits, to no more than Rs. 350 ! The village at that time belonged to the Sattara State, and the object of the plundered parties in assessing their losses at so great an amount was, that, in accordance with the custom of the Sattara Durbar, they might obtain a comparatively high award against the village Ramoosees or watchmen, who would be called upon to make good the same, *which generally they have only been able to do from the proceeds of dacoities they themselves have been obliged to commit*

in consequence. The Naik of the gang, a very celebrated leader, and now an approver, while escaping from this dacoity, suspected that his men had not given up everything that had been robbed, for he had expected a much larger booty ; so that, after crossing the river Bheema, he halted the gang, and had recourse to a plan sometimes adopted by the tribe, of making every one step into the water with a belt of unslaked chunam fastened round the waist ; the belief being, that if the man undergoing such an ordeal were innocent, the lime would not be affected by the water ! The plan used to have, nevertheless, the effect, upon superstitious minds, of leading a delinquent to discover himself by symptoms of fear *before* he stepped into the water,—not that the lime would not really get slaked by it if he were innocent. On the present occasion, the Naik saw that all went into the river fearlessly ; from which he felt satisfied that no part of the booty had been concealed by any one of them. The fact of this plan having really been resorted to was, to my mind, however unusual the argument, a further proof that the Koolkurnees had given an exaggerated return of their losses.* They are the parties adverted to in the account of the dacoity at Kaseegann under No. 2.

One of the brothers, with a party of men, pursued the robbers, and traced them to a village in the Mólhole Talooka, where the leader (Purrakurnee) resided under an assumed name ; and he and two or three others of the gang were seized, for he was recognised from a wound on his foot, which the Koolkurnee had, during the robbery, himself inflicted with a stone flung at him from the house-top, and he saw that it had made him limp ; but as the village was out of the jurisdiction of the territory (Sattara) from which the pursuit had issued, the Patel of it, who was in league with the Dacoits, in the first place allowed Purrakurnee to escape, and to conceal himself in the neighbouring common disguised as a female, and then he refused to give up any of the other prisoners. A complaint was made on the subject, but without redress. It was after this that the Koolkurnees arrested the other gang of Dacoits, as they were passing by Khurdee with the booty recently obtained in the dacoity at Kaseegann, mentioned under No. 2.

Strength of the gang.....	13
Approver under sentence of life transportation	1
Transported for life	4
Limited imprisonment with hard labour.....	1
Deceased	0
At large.....	7
Total....	13

* Which was afterwards discovered to have been really so, for the reasons already given.—C. H.

REMARKS ON DACOITY No. 4.

This dacoity was upon the house of a wealthy Brahmin. After posting their watches round about the premises in the usual manner, the Dacoits applied a ladder to a window that was high up in a side wall of the house, and which they broke with a hatchet. Two or three robbers leaped down through it, and so opened the yard door of the house for their associates outside, who rushed in and got possession of a booty to the value of about Rs. 1,500, obtained as well from the persons of the female inmates and children, as from a closet which they had broken into. They were pursued by the villagers, but no one was captured. They reached their encampment at Therla,* near Poona, next day, and at sunset they buried their booty in a field belonging to the Patel of the village. He perceived this, and, digging it up, took possession of it. A few days after this, the robbers discovered their loss, and thereupon they threatened the Patel, declaring they would attack his house next, and murder him; upon which he restored a portion of the property, retaining a few of the articles. His questionable conduct in this transaction was brought to the notice of the District Authorities, but no punishment followed. When summoned to give evidence in this Office, he spoke with great reservation, and it was not till a fellow Patel spoke out about the whole business, that he thought proper to admit the above facts, which had been previously spoken to, not only by the approver to this dacoity, but were found to be recorded in the documents appertaining to the investigation that took place at the time.

Strength of the gang	21
Approver under sentence of life transportation	1
Transported for life	15
Limited imprisonment with hard labour.....	2
Under investigation	1
At large.....	2
	<hr/>
	Total.... 22

REMARKS ON DACOITY No. 5.

This dacoity was upon two houses adjoining each other, and the gang divided itself into two bodies, each under a distinct leader, and so plundered both dwellings. The entrance into one was effected through the roof,

Dacoity at Bulsar, in the
Surat Zilla, by a Poona Gang.

* Distant about forty-five miles.

and into the other by breaking through a window, by which means the front doors of both were opened from the inside. The booty obtained from either house was to the extent of Rs. 2,500 (or Rs. 6,152-12-0 according to the plundered parties). On leaving the premises, the Dacoits found themselves surrounded by the assembled villagers, accompanied by some sepoy of the line ; but, without hesitation, the robbers boldly fell upon them, and broke through them. Only one man was seized, after he had been cut down by one of the sepoy. He is now an approver, and was the first man of the Kaikaree tribe who became an approver.

Strength of the gang	24
Approvers under sentence of life transportation.....	4
Transported for life	19
At large.....	1
	<hr/>
Total.....	24

REMARKS ON DACOITY No. 6.

This robbery was upon the dwelling of an influential Jagheerdar. On the Dacoits arriving at the premises, their first act was to lay hold of some sepoy who were asleep at the vestibule, and to tie them up by their elbows. They then posted the usual watches, and next broke through a wicket in the large front door. In the mean time the alarm had been taken up, so that the Dacoits were thwarted, and had to set about escaping. In a body, they fell upon the assembled village people, and fought their way through them. They were, however, pursued for some distance in the dark, along the bank of the river Krishna, and on reaching a spot where there was a threshing-floor, they found themselves assaulted by the people in charge of it. A regular fight now ensued; the Dacoits prevailed, and, escaping, dispersed in all directions; but one of them had got seriously wounded, and he was made a prisoner. He was sentenced by the Commissioner at Sattara to three years' imprisonment with hard labour, and he is now an approver. His account was,—“ We were assailed by the village people, and had no time to obtain any plunder ; but forgetting our road, we took another. I had been posted in one of the lanes, and so got left behind. Five or six village Ramoosees surrounded me. I knocked one of them down with my club. My feet, however, got entangled in the strings of a sling, with which I was also provided, so as to make me fall down ; whereupon the other Ramoosees set upon me, and cut me about with

their swords." He was regularly *mauled*, and his sword-wounds were six in number : a deep gash across his nose and face, giving him a frightful appearance; two cuts across the right arm, above the wrist, to which the hand now hangs; a deep cut over the left shoulder, and another long gash across the left thigh; and forefinger of the right hand cut off.

Strength of the gang	17
Approver under sentence of life transportation	8
Transported for life	7
Killed in a subsequent dacoity.....	1
At large.....	1
Total....	<hr/> 17

REMARKS ON DACOITY No. 7.

This was upon the house of a Brahmin Shroff. The Dacoits had their 'tippun,' or rendezvous, at Temboornee, which, though Dacoity at Nursingpoor, in the Poona Collectorate, by a Sholapore Gang, six miles from the place of the dacoity, was not approved of by a celebrated character of the gang named Ellia Kongaria, or the 'Quarrelsome Ellia,' now an approver. He declared harm would come of it, as that it was too close, and so sulked, and withdrew from the enterprise. The dacoity was nevertheless committed, and a booty carried off to the value of Rs. 139-8-0. The Dacoits had, however, been resisted, and one of them was shot down. He was carried off by his comrades; but, as they were pressed, they were obliged to put him down and make off. The wounded man was taken by the Police in triumph to Inda-poor, the chief town of the Talooka so called. As anticipated by the Police Amuldar and his people, the man's wife and children appeared early next morning, for they were at the Dacoits' rendezvous. It was expected that through them he would be led to confess, or that they would be induced to lead the Police upon the rest of the gang. But the Dacoit remained staunch; he would not acknowledge his wife,—declared he did not know who she was,—and died!

Strength of the gang	15
Transported for life	2
Deceased	1
Released	1
At large.....	11
Total....	<hr/> 15

REMARKS ON DACOITY No. 8.

This robbery was effected at midnight, by the Dacoits applying a ladder to the house. Seven of their number ascended by it to the terrace, where they broke through a wicket leading down some stairs into the interior of the house. They then broke into the room in which all the valuables were kept, and from it obtained a bag containing Rs. 1,000 in cash. They got also other things, to the value of about Rs. 2,500 more. In the mean while, the alarm having been taken up, the house was surrounded by the villagers, accompanied by some sepoy of the line, upon which the Dacoits sallied out in a body at the front door of the house, and, boldly falling upon them, made off. The Dacoit who carried the bag of money was, however, grappled with by one of the sepoy. In the struggle the bag was dropped, but the Dacoit threw off his opponent and escaped. According to the approvers, the value of the booty amounted to no more than Rs. 400, because they got no more for it.

The gang consisted of sixteen men, of whom ten have been sentenced to life transportation (including four approvers), four have died, and two are at large.

REMARKS ON DACOITY No. 9.

This robbery was upon the house of the Sheristadar of the Magistrate's Office, Dhoolia being a Civil Station. After lighting their torches, some of the gang climbed upon the terrace of the house, and descended into the enclosed yard of it through a water-spout. The yard door was thus opened for the rest, who then broke through the door of the house, and plundered it to the extent of Rs. 2,000 (or Rs. 2,963-8-0 according to the plundered party). The females of the house were deprived of their ornaments. The robbers were pursued, but no one was seized.

Strength of the gang 18

Disposed of, viz :—

Approvers under sentence of life transportation.....	8
Transported for life	4
Deceased	3
At large.....	3

Total.... 18

REMARKS ON DACOITY No. 10.

This robbery was upon the house of a Brahmin, upon information obtained from a Vakeel or pleader practising in the Court of the Session Judge of Tanna, and who had often been employed by the tribe to plead their cause when they have occasionally been tried in that Court ; so that a mutual understanding had sprung up between them. He appointed one of his own men to accompany the gang, and lent them, moreover, some weapons. The gang proceeded from Tanna itself, where the above individual resided. The premises were surrounded in the usual manner, and the approaches to it blocked up with thorns. A window was then broken, and entered, and the door of the house thus opened from the inside. The booty was to the value of Rs. 100 (or Rs. 1,385-8-0 according to the plundered party), a portion whereof was given to the Vakeel, who deposited the same in the house of another Vakeel. The latter gave information thereof, whereupon the other was seized, and, through him, the whole of the gang was taken into custody. By dint of blows and threats (say the approvers), they confessed. One was admitted as Queen's evidence, and the trial ended in the conviction and imprisonment with hard labour of eight men, including the Vakeel and his servant, to the imprisonment of another for twelve months, and one man was acquitted. The leader of the gang escaped.

Strength of the gang, excluding the Vakeel and his servant.....	11
Approver under sentence of life transportation	1
Transportation for life, <i>including the leader</i>	6
Limited imprisonment with hard labour	2
Under investigation	1
At large	1
	<hr/>
Total....	11

REMARKS ON DACOITY No. 11.

The robbers on this occasion, at the outset, thrashed and secured the persons of eight or ten village guards, who were sleeping at the 'chowree' or police station, which was close to the house. Some of the Dacoits were

Dacoity at Sacegaum, in the
Sattara State.

appointed to look after them, and keep them quiet, while the rest made the attack. A ladder was placed against a wall, the yard leaped into, and the principal door opened. The robbers then, after lighting their torches, forced open the door leading into the house, and from the persons of the female inmates obtained a booty to the value of about Rs. 2,000 (or Rs. 4,725-8-0 according to the account of the plundered Brahmin). The gang escaped, as usual.

Strength of the gang, Kaikarees	22
Approvers under sentence of life transportation	2
Transported for life	16
Limited imprisonment with hard labour	2
Under investigation	1
At large	1
Total	22

REMARKS ON DACOITY No. 12.

This was upon the house of a Jagheerदार, and was the deed of a Sholapore gang. The house happened to be close to the village wall, by which, indeed, the yard of it was enclosed on one side. There was a door there. A ladder was placed against this wall from the outside of the village, and thus that door was opened from the inside. The front door on the village side was then secured, to prevent any attack in that direction. The booty on this occasion amounted to Rs. 1,200 (or Rs. 5,423-14-0 according to the house-owner). The Dacoits escaped through the door in the wall. The owner of the house believed that one of his female servants was associated with the robbers, and had let them in through the postern above described, and she was, upon the evidence he got up against her, tried in a Sessions Court, and, on conviction, sentenced to imprisonment with hard labour for eighteen months.

Strength of the gang, Kaikarees	15
Approvers under sentence of life transportation	2
Transported for life	12
Killed in a subsequent dacoity	1
Total	15

REMARKS ON DACOITY No. 13.

This dacoity was also committed by a Sholapore gang. The booty was to the value of Rs. 400 (or Rs. 874-5-9 according to the owner of the house). The robbers escaped, but six of the villagers were tried for the robbery in a Sessions Court, and were sentenced to imprisonment with hard labour for six years; but on a representation from this Office to Government of the real culprits having been professional Dacoits, they were liberated. A Duffedar of Police was also sentenced to eighteen months' imprisonment on account of this robbery, for neglect, with loss of situation; but, on his appeal through this Office, he was reinstated.

Strength of the gang, Kaikarees	16
Approvers under sentence of life transportation.....	3
Transported for life	11
Killed in a subsequent dacoity	1
At large.....	1
	<hr/>
Total....	16

REMARKS ON DACOITY No. 14.

The owner of the house had succeeded, by threatening the village Ramoosees with a trial, to obtain from them a compensation for this robbery, and he had reported to the District Authority that he had no demands to make on account of his losses; so that when the real culprits were subsequently seized by this Agency, with a portion of the property, and the man's evidence was required in this Office, he withheld it, owing to the above circumstance, and I very nearly failed in proving this dacoity in consequence. The Dacoits were, however, convicted in a Sessions Court; but the sentence was annulled by the Judges of the Sudder Foujdaree Adawlut.

Strength of the gang, Kaikarees	14
Approver under sentence of life transportation	1
Transported for life	2
At large.....	11
	<hr/>
Total....	14

REMARKS ON DACOITY No. 15.

Two ladders were used in this dacoity, and the entrance into the premises effected at two points, through windows that were broken open with hatchets. The front door was thus opened. The house was then plundered. A booty to the extent of about Rs. 6,000 had already been obtained, and the plunder was still going on, when, by accident, some silk cloths took fire from one of the torches, the smoke arising from which blinded the robbers, upon which they left the house. All escaped. The gang was from Poona, and consisted of—

Kaikarees	17
Approvers under sentence of life transportation	6
Transported for life	9
Deceased	1
At large	1
Total.....	17

REMARKS ON DACOITY No. 16.

This dacoity was upon the house of the late Captain Hart, of the 6th Native Infantry, situated near the bridge at the Sungum, or junction of the rivers Moolla and Mootta, close to the Adawlut, and to the residence of the Session Judge of Poona, in whose grounds a Kaikaree Dacoit, under sentence of hard labour *for a crime he had not committed*, had of late been daily employed as a malee or gardener. The robbery was committed by a joint gang of Kaikarees and Ramoosees.* The robbers were detected entering the house, and one of them was seized, they said, by the saheb (I believe, by Captain Hart himself). The rest escaped, but a few days subsequently four others of the Ramoosee portion of the gang were arrested. They were tried: one man was transported for life, three were acquitted, and one died before trial.

Strength of the gang	13
Approvers under sentence of life transportation.....	2
Transported for life	3
Deceased	1
At large (Ramoosees)	7
Total.....	13

* This was after this Malee-Dacoit had undergone his sentence. He told me that he used often to mark Captain Hart's house with a wistful eye, from the garden of the Judge, but he did not himself take active part in this robbery.—C. II.

REMARKS ON DACOITY No. 17.

This dacoity took place at midnight, upon the house of a Brahmin at Dapooree, hard by Government House. The robbers forced their entrance into it by bursting open the door with stones; they deprived the females of the house of their ornaments, and so carried off a booty to the value of Rs. 300. So say the approvers to this dacoity; but the owner of the house would not give in any list of the same, declaring nothing was taken. All escaped.

The gang consisted of 23 men, of whom a Naik and 3 Dacoits are approvers under sentence of life transportation; 9 others have been transported for life, 8 have died, and 2 are at large.

REMARKS ON DACOITY No. 18.

This was upon the house of a Portuguese. Having, in the usual manner, posted their watches round about the house, the Dacoits lighted their torches, and, with hatchets, broke through the door. They rushed in, and deprived the female inmates and children of all they had upon them, and made off with a booty to the value of Rs. 100 (or Rs. 160 according to the plundered party). They escaped.

Strength of the gang, Kaikarees	13
Approver under sentence of life transportation	1
Transported for life	7
Limited imprisonment with hard labour	2
In custody	1
Deceased	1
At large	1
	<hr/>
	Total.... 13

REMARKS ON DACOITY No. 19.

This village is on the Island of Caranjah, which forms one of the tall hills on the other side of the Bombay Harbour. The robbers, who were from Poona, got upon the island from the mainland at low tide, and escaped, after

Dacoity at Oorun, opposite to Bombay.

committing the robbery, at high tide, by means of gourds. The village people in consequence thought that they were still on the island, and so they searched it in all directions. The robbers, mean time, were safe enough with their booty. The entrance into the premises was effected by the good woman of the house coming to the door and opening it to see what the noise meant the robbers were making,—they were endeavouring, with an axe, to force a window. She was immediately laid hold of, and deprived of her ornaments. A box was broken into and rifled, and a booty obtained to the value of Rs. 2,500 (or Rs. 3,550-4-0 according to the plundered party).

Strength of the gang, Kaikarees	12
Approver under sentence of life transportation	1
Transported for life	7
Deceased	3
Escaped before trial	1
	<hr/>
	Total.... 12

REMARKS ON DACOITY No. 20.

This was done by a gang from Sattara, and was upon the house of a Brahmin in the village of Mahableshwur, near the Sanitarium Station on the hills so called. The robbers during the day concealed themselves in the adjacent forest, and at night came to the village from the direction of Nehur, near to the European bungalows. They posted their guards round about the house in the usual manner, lighted their torches, broke down with axes the door of the house, made the females give up all their ornaments, and made off with a booty to the value of Rs. 50 (or Rs. 395-8-0 according to the Brahmin's account). They escaped by Nehur, descended the Ghaut on the Sattara side, and got down to their encampment *in the city of Sattara*,* by the route that leads down to it over the Eoteshwur Hill. This was the second robbery at Mahableshwur by the same gang.

Strength of the gang, Kaikarees	18
Approvers under sentence of life transportation	4
Transported for life	6
At large	8
	<hr/>
	Total.... 18

* Distant about thirty-two miles from the village of Mahableshwur.—C. H.

REMARKS ON DACOITY No. 21.

After effecting an entrance into the house by breaking through the door, one of the robbers struck the owner upon the head with a club, and knocked him down. A booty to the value of Rs. 100 had been obtained, when suddenly four Gosaens* fell upon one of the pickets of the robbers posted in one of the lanes outside, and wounded one of them, which caused those posted outside to make off. The Gosaens then rushed into the house, and wounded another Dacoit; this made these also retreat through a back door. The villagers pursued them in the dark, whereupon the Dacoits rushed into a tank, and hid themselves in it, in the water, in which, too, they threw away their plunder. The villagers lighted fires round about the tank, and remained by it for about an hour. At last, the search was given up, and they retired. The Dacoits then got out of the water, and escaped to their encampment, but they lost the whole of their plunder, except a gold amulet. According to the plundered party, the loss he sustained amounted to Rs. 409.

Strength of the gang, Kaikarees	8
Approvers under sentence of life transportation.....	2
Transported for life	3
Deceased	2
At large.....	1
	<hr/>
Total....	8

REMARKS ON DACOITY No. 22.

This robbery was upon the house of a Lingayut† merchant. The robbers took with them a ladder they had observed usually placed in the Musjid‡ of the village. With this they got upon the terrace, and then jumped into the yard, and laid open the front door. The door of the house was then broken, and the Dacoits rushed through it with lighted torches, and carried off a quantity of valuables, to the extent of, they believed, Rs. 4,000 (or Rs. 2,397-4-6 as stated by the owner of the house). While making off with their booty, they were opposed by the assembled villagers, but they forced their way through them, and escaped unscathed. Next day, however, they were traced up to their encampment, and the whole seized. "We were beaten and

* Religious mendicants of the Hindoo sect.

† A Hindoo sect.

‡ A Mussulman place of worship.

knocked about, and so we confessed and gave up all our booty,* after which we were tried and convicted" (namely seven men to three years' imprisonment with hard labour, and nine to imprisonment for one year).

Strength of the gang	16
Approvers under sentence of life transportation	9
Transported for life	5
At large	2
Total....	16

REMARKS ON DACOITY No. 23.

In this affair the Dacoits were pursued. The village is close to Bombay, and is divided from Bandora Hill by a creek. The water in the creek, when they went to the robbery, was but waist-deep, but the tide had filled when they retreated from it, so that they had to wade through the creek up to their breasts in water. Booty Rs. 150 (or Rs. 307 according to the owner of the house).

Strength of the gang, Kaikarees.....	13
Approvers under sentence of life transportation	4
Transported for life	5
Deceased.....	1
At large	3
Total....	13

REMARKS ON DACOITY No. 24.

The village where this dacoity took place is within about double musket-range from the residence of the Session Judge of Sholapore, and not much further off from the Criminal Jail. The robbers, after taking the usual precautions outside, climbed up to the terrace, from where a couple of them got down by some stairs into the enclosed yard, the door of which they opened for the rest of their associates. The owner of the house was a Koonbee, or cultivator, and he, his brother, and family were sleeping in a kind of

* Which they had not yet examined, and so believed it was greater than really was the case.

covered veranda. He awoke, and with a churning-staff at once attacked the foremost of the gang, backed by his brother. Both were immediately slaughtered. The booty was to the value of Rs. 300. The Dacoits were not pursued. The alarm of this robbery was taken up in the neighbouring Military Cantonments; patrols were sent about, and the Magistrate reported that he believed the intention had been, on the part of the "numerous gang" by whom it was believed the deed was committed, to have attacked some house in the city that night, but that they had desisted from finding the Police on the alert, and had thereupon committed the robbery at the neighbouring little village. The robbers, however, had long previously planned, not any robbery at Sholapore, but the very one they in fact committed,* and they, as well as a large number of the tribe, had for years resided in the adjacent Talooka of Móhole. All escaped.

Strength of the gang, Kaikarees	14
Approvers under sentence of life transportation	2
Transported for life	6
Sentenced to life transportation, but released by the Session Judge of Dharwar, under a misapprehension	3†
At large	3
Total....	14

REMARKS ON DACOITY No. 25.

The obsequies of a relative were that night being performed at the house attacked on this occasion. There was a large assembly at the premises; the dead body had been placed in a sitting position, and was surrounded by men and women engaged in chaunting; the door of the house was therefore open. The Dacoits were not aware of these proceedings when they suddenly arrived at the place, which they had marked down to be robbed that very night. They had already posted the different watches round about, and were proceeding to rush in, when they perceived what was going on inside; but they were not to be balked, and so rushed in. The funeral party at once sat down, aghast; not one raised the slightest opposition. After hurriedly obtain-

* They had, a few nights previously, attempted a dacoity at another village, further on.

† Of whom one got killed in a subsequent dacoity at Chikhullee, in the Akulkote State, and two are at large. (The latter have been recaptured, and await transportation.—May 1858.)

(Signed) C. HERVEY.

ing a few articles of property, to the value of about Rs. 40 or 50,* they decamped. They were pursued by the villagers, who, however, ran back on being threatened. All escaped.

Strength of the gang, Kaikarees	17
Approvers under sentence of life transportation.....	4
Transported for life	6
Deceased	4
At large.....	3
	<hr/>
Total....	17

REMARKS ON DACOITY No. 26.

The Dacoits, under Purrakurmee Naik, were on this occasion pursued while carrying off their booty. A sort of running fight ensued; at three several points they stood, and endeavoured to check their pursuers, who happened to be led on by a brave village Shetsundee or Policeman, of low caste. Purrakurmee and his brother-in-law were both wounded by him; but all eventually escaped, favoured by the darkness. Next morning, they were traced by the above indefatigable Dhér to their encampment at Khunbus and Rutnapoor, villages that adjoined each other; but the Patels of those places had long harboured these men, and so let them secrete themselves in the adjoining common, declaring they knew nothing about them. I offered the Dhér the place of a Nujeeb in my establishment, but as his village holding was at Mungloor, he could not accept the offer; so that, with the permission of Government, he was publicly presented by me, in the Court of the Political Agent of the Southern Muratha Country, with a silver bangle.

Strength of the gang, Kaikarees	19
Approvers under sentence of life transportation.....	4
Transported for life	1
Killed in subsequent dacoities	2
Deceased	2
At large (one of whom, after sentence to life transportation in another case, had been inadvertently released by the Session Judge†)....	10
	<hr/>
Total....	19

* The owner did not say that he had been robbed of anything.

† He was subsequently recaptured.

REMARKS ON DACOITY No. 27.

This dacoity was conducted by a celebrated leader of the Sholapore gangs, now an approver, who, from having always resided at a village called Nad, got the name of Nad-Tookya. He is a brother of Balia Naik, mentioned under dacoity No. 29. The Dacoits, after they had decamped, and had even reached the outside of the village, discovered that five of their number had been left behind within the premises. They flew back to the rescue. The house was surrounded by the village people, whom they immediately attacked, and two of them were cut down and killed, and the rest put to flight. The Dacoits then rushed into the house, but found that the captured Dacoits had, after disabling three of the inmates of the house, meantime managed to escape by some stairs that led up to the terrace, from which they had leapt down, and so had got away. Upon this all retired. Only one of the Dacoits was wounded in this business, and that but slightly. They lost, however, the most of their booty. All escaped.

Strength of the gang, Kaikarees	19
Approvers under sentence of life transportation	3
Transported for life	4
Deceased	1
At large	11
Total....	19

REMARKS ON DACOITY No. 28.

Two of the gang in this dacoity were lads, and had a year previously been in my custody. They were brothers, and as they had not committed any dacoity with any of my approvers, I had released them. One of them was killed in this affair, and the other, being badly wounded, was seized. I admitted him as an approver, and then learnt from him that *prior* to his release by me he had actually taken part in *as many as twenty-six dacoities*, mostly in the Sholapore Zilla! Balia was again the Naik in this affair. The booty was small, most of what had been obtained having been thrown down in the premises.

Strength of the gang, Kaikarees	12
Approvers under sentence of life transportation	3
Transported for life	4
Killed in the dacoity	1
At large	4
Total....	12

REMARKS ON DACOITY No. 29.

This dacoity was committed by Balia Naik, at the instigation of the son of the Deshpandéh of the place, with the view to the murder of his father's kept mistress, against whom he had a grudge; *and she was murdered accordingly*. She, however, had at once pointed out the closet in which her ornaments were deposited, so that the robbers flew to it, and would have spared her; but presently it was perceived that she wore a valuable saree, of which they began to deprive her. She resisted this, saying that they had got enough, and must leave something upon her; whereupon *they remembered she was to be murdered*, and she was despatched accordingly. The Deshpandéh himself escaped only with his life, after sustaining some severe injuries. The booty was to the value of Rs. 1,024. All escaped to their respective villages in the Indee and Hyypurga Talookas.

Strength of the gang	30
Transported for life	4
Deceased	2
At large	24*
Total....	30

REMARKS ON DACOITY No. 30.

This was upon the house of a Jungum. The robbers were pursued, and a fight ensued; on the side of the villagers, three or four men were severely wounded, and one was killed; one of the Dacoits, too, was cut down, but he was carried off by his associates. By the time they had reached a nulla close to Kulkéhree, the day had dawned, so that they concealed themselves there, and they sent one of their number into the village for some liquor. He came back with a quantity of it, but was himself drunk. Associated with the gang were a Wanee and a Jungum. All drank freely. The Wanee was charged with appropriating a portion of the booty; a drunken broil ensued; the leader of the gang,† with a blow of his sword, cut off the Wanee's head. The body was immediately buried in the sand, in the bed of the nulla. Next day, the headless trunk was found left by the water at a neighbouring village, and as it was known that the above dacoity had taken place two nights pre-

* I have not any approver who was an accomplice in this robbery as yet. Great efforts were made on the part of Balia's brother (approver Nad-Tookya, mentioned under dacoity No. 27) to persuade me to admit Balia to that grade, but I would not consent to it.—C.H.

† This Naik's name was Rania.

viously, and that one of the Dacoits was stated to have been killed and carried off, it was declared by the inquest that "the corpse now found was that of the Dacoit." He, however, is now alive. All the Dacoits escaped.

Strength of the gang, consisting of Kaikaree and Mooltanee

Dacoits*	29
Approver under sentence of life transportation	1
Transported for life, including the leader	3
Deceased	6
At large.....	19
Total....	29

REMARKS ON DACOITY No. 31.

The Dacoits had committed this robbery at a late hour, so that at dawn they halted at a village some little distance from Beejapoor. They were in the act of examining their booty, when they were tracked up and found. The leader of the gang, a notorious Naik, since deceased,† happened to be mounted at the time : one of the Police laid hold of the bridle of his horse, and struck at him with his sheathed sword. The blow was parried, and the robber leaped off his horse, and escaped, with all his men. The horse, however, and a pack bullock laden with the booty, fell into the hands of the Police.

Strength of the gang, consisting of Kaikarces and Mooltaneees.. 18

Approver under sentence of life transportation	1
Transported for life	4
Deceased.....	4
At large	9
Total....	18

REMARKS ON DACOITY No. 32.

The Dacoits on this occasion set fire to the house, for they were opposed by the owner of it, who stood at the door armed with a threshing-staff. They struck at him, but he parried their thrusts, and even broke a couple of their swords. Out of feelings of revenge at having been baulked by him of

Dacoity at Allullee, in the Sholapore Zilla, under Nad-Tookya Naik.

* These Mooltanee Dacoits are not the same class of robbers so called in Upper India, but are a different people, and in these parts are also called Juts and Jutters, and sometimes Kuntmés.

† Called "Tookia of Mulgau."

their booty, they set fire to a pile of wood close to the house, and in the conflagration his child was burnt to death ; also all his cattle, and grain, and everything he had, were destroyed. Three of the Dacoits mingled with the crowd that assembled to witness all these results. Satisfied with the mischief they had already occasioned, one of them rushed into the house, and brought out the man's wife. The owner himself was badly burnt, and had fainted and fallen down, and he also was rescued by them from the flames. All the Dacoits escaped.

Strength of the gang, Kaikarees.....	13
Approver under sentence of life transportation	2
Transported for life	3
Deceased.....	6
At large	2
Total....	13

REMARKS ON DACOITY No. 33.

This dacoity was also under the leadership of Balia Naik, and it was committed upon a party of Revenue Surveyors, at the instigation of the Patel of the village, who had been discovered by them to have rendered a false statement of his village lands. He had endeavoured to bribe them not to make any report of it, and as it was an object to deprive them of the documents in their possession by which his guilt could be proved, he invited Balia from Nad, to rob them, promising him Rs. 50 if he would bring him the papers, which he told them were kept in a certain box, which they were to carry off. The Surveyors were lodging in a Musjid outside of the village, and the robbery was effected in a masterly style, *exactly as the Patel wanted it to be done.*

He was lately arraigned by me with the Dacoits of the gang, and, with them, was sentenced to life transportation by the Political Agent Southern Muratha Country, but Government did not consider the conviction in his case to be sustained, and he was therefore released, on furnishing security.

Strength of the gang, Kaikarees.....	11
Approver under sentence of life transportation	1
Transported for life.....	5
Deceased.....	2
At large	3
Total....	11

REMARKS ON DACOITY No. 34.

In a former dacoity at this village, four favourite members of the tribe, who were brothers, had lost their lives; and this had long been brooded over. The present robbery was therefore undertaken more from motives of revenge, with the view to the murder of some of the village people. The booty did not amount, according to the account of the robbers, to more than Rs. 20. They cut down the owner of the house, and one of his sepoys. The villagers, however, did not oppose the robbers on this occasion, and so nothing further transpired. The encampment of the Dacoits was not far off, but no pursuit was made, nor attempt to find them out.

Strength of the gang, Kaikarees	17
Approver under sentence of life transportation.....	1
Transported for life	3
At large	11
Deceased	2

Total.... 17

REMARKS ON DACOITY No. 35.

The gang in this dacoity was joined by some of those who, *after conviction and sentence to life transportation on a committal from this Office, had, by the Judges of the Sudder Foujdaree Adawlut, been set at liberty.* One of the latter was killed in this affair, and three others of the gang were wounded. It was an unsuccessful dacoity, for three of the robbers were seized. They were tried at Akulkote by the Durbar, but were released, except one man, who, on being sent to this Office, was admitted by me as an approver.

Strength of the gang, Kaikarees.....	12
Approver under sentence of life transportation	1
Transported for life	1
Killed in the dacoity	1
At large	9

Total.... 12

REMARKS ON DACOITY No. 36.

This dacoity was committed in the dark, *without torch-lights*, and a man of the house was stabbed to the heart while endeavouring to grapple with one of the Dacoits.

Dacoity at Munnoor, in the Sholapore Zilla.

Strength of the gang, Kaikarees	13
Transported for life	1
Limited imprisonment with hard labour for seven years	2*
At large	10
Total....	13

REMARKS ON DACOITY No. 37.

This was a dacoity upon the threshing-floor of a cultivator in a field outside of the village, and was committed by moonlight.

Dacoity on a Threshing-floor at Latchan, in the Sholapore Collectorate, by Nad-Tookya Naik.

On the present occasion, the Dacoits were actuated by revenge. One of them happened, during the day, to have been detected pilfering ears of corn from the field in question, and the cultivator had slapped him on the face, and deprived him of his blanket. He swore he would be avenged, and went and complained to his associates, whom he easily persuaded to plunder the store of grain. This they did at midnight, *and they murdered the poor man also*. Another keeper of the field ran off, but was pursued, and cut down. He begged for his life, and was let off.

Similar robberies of grain, collected on threshing-floors in the open fields in harvest-time, have constantly been committed by the Sholapore gangs, *invariably by moonlight*, and on almost every occasion have been attended with murder and wounding, *and the real culprits have seldom been seized*.

Strength of the gang, Kaikarees	14
Approvers under sentence of life transportation	3
Transported for life	6
Killed in a subsequent dacoity, namely a son of the Naik on the occasion	1
At large	4
Total....	14

* These two men had also been sentenced to life transportation, but the sentence was commuted by Government to seven years' imprisonment with hard labour.

REMARKS ON DACOITY No. 38.

The plan on this occasion was to plunder the house of a certain Sootar, or carpenter. The attempt was made, but it began to rain heavily, which prevented the Dacoits from lighting their torches; besides which, the people of the house became aware of their presence, so that the Dacoits left that house, and went to another that had not any court-yard to it; but they plundered it of but a few things, as, on account of the rain and extreme darkness, they were unable to find more. They were pursued, but managed to get clear of the village; but at about a koss from it they were stopped by a nulla, which they found to be a perfect torrent, caused by the rain. Three of them tried to swim across it, but one of the number was drowned. By this time it began to dawn, so that the robbers were obliged to throw away their booty into the nulla, and to double back, and get to their encampment by a circuitous route. All escaped.

Strength of the gang, Kaikarees	15
Approvers under sentence of life transportation	3
Transported for life	5
Drowned at the time	1
Deceased	5
At large	1
Total....	15

REMARKS ON DACOITY No. 39.

This was a robbery by a Dharwar or Canara gang.* Cholera was raging in the village at the time, and the inhabitants, in great alarm, slept every night outside of their houses. Some of the village Police were in league with the robbers, and advised them to take advantage of this circumstance, as that no resistance was likely to be offered. The dacoity was committed accordingly. The house was broken into, and a booty to the value of Rs. 7,000 carried off; but a large quantity of this the robbers lost, for they had buried it in earthen vessels in the sand in a certain nulla. In the mean time, twelve of their number, with some of the villagers, were seized on suspicion. Their case was under investigation for three months, and they were eventually desired to furnish heavy securities. This they succeeded in doing *by paying*

* So called, because they plunder on both sides of the border. On the Canara side, these Kaikaree or Korwee robbers are called *Korchurs*.

men to become their securities, and they were released.* In the mean time, the rains had commenced, and the Dacoits found that what they had hidden in the nulla had been washed away by the inundations. The Kotwal of Dharwar was declared by the Dacoits to have been in league with them, and to have favoured their release, by receiving from them two or three very valuable gold ornaments out of their booty.

Strength of the gang, consisting of the quotas of seven Naiks..	31
Approvers under sentence of life transportation	8
Transported for life	10
At large, mostly village people	13
Total....	31

REMARKS ON DACOITY No. 40.

This was a dacoity upon the house of the Agent of a Jagheerdar of the Southern Muratha Country; the females of it were deprived of their ornaments. The owner escaped to the roof by a trap-door. His son had valuable bracelets on his wrists, which the robbers tried in every way to get possession of: they smeared the boy's hands with oil, put rice husks over them, and were on the point of cutting off his hands, when at last one of them managed to get possession of the coveted articles, after lacerating the poor child very much. Booty Rs. 40 (or Rs. 730-1-6 according to the house-owner). The latter made himself very useful to me in tracing out this robbery, and in prosecuting the robbers to conviction.

Several men (villagers) were tried for this dacoity, and sentenced to limited imprisonment with hard labour; but they were eventually released by Government, on a representation from this Office that the deed had been that of professional Dacoits.

Strength of the gang, consisting of the quotas of nine Naiks..	29
Approvers under sentence of life transportation	7
Transported for life	11
Deceased.....	1
At large	10†
Total....	29

* The most of whom were real culprits; but they were arrested by this Department, and are of those who were subsequently convicted.

† Of whom four were aged Dacoits, who were released by me on security, and placed under the Police of certain villages.

REMARKS ON DACOITY No. 41.

This dacoity was upon the house of a Têlee or oilman. All approaches to it were blocked up by the robbers with thorns. A hole was dug through the wall at one side of the door, by which means the cross-bar and fastenings inside were removed. They then entered the dwelling with lighted torches, and deprived the inmates of whatever they had upon them. The village people flung stones at the Dacoits posted outside on the watch. Stones flew on both sides ; and two or three of the villagers were hurt. The Dacoits withdrew, without discovery, to their encampment in the waste country beyond Gokak. A large number of people were seized on suspicion for this robbery, and among them, by chance, *the Naik of the Gohak portion of the gang, also one of his men ; but all were released, except some of the villagers of Yemkunmurdee, who, because they were declared to have been at enmity with the owner of the house, were, upon his evidence, and because they confessed, tried, convicted, and sentenced to five years' imprisonment with hard labour. They underwent the whole of the punishment. Towards the close of that period it was represented from this Office to Government that the real culprits were professional Dacoits, but Government on this occasion did not direct the release of the villagers.*

Strength of the gang, consisting of Kaikarees or Korwees,*

the quotas of three Naiks.....	16
Approvers under sentence of life transportation	3
Transported for life, including the three Naiks	8
Limited imprisonment with hard labour	1
At large.....	4
Total....	16

REMARKS ON DACOITY No. 42.

When the Dacoits essayed with their hatchets to break down the door of the house, in this dacoity, the owner of it stood at the inside of it, armed with a large club, and kept the door secured. A hole, however, was made in it, through which one of the Naiks thrust his

Dacoity at Moolgoond, in the Elaka of a Putwurdhun of the Southern Muratha Country, Zilla Dharwar.

* In the southern districts, the Kaikarees are known as *Korwees* ; and elsewhere under different designations.

sword, and wounded the man on his arm ; but he remained at his post. So the Dacoits got nothing, and had to decamp.

Strength of the gang, including eight Naiks (Kaikarees)	42
Approvers under sentence of life transportation.	7
Transported for life	15
Deceased	2
At large	18
Total	42

REMARKS ON DACOITY No. 43.

The booty on this occasion, according to the Dacoits, was to the value of Rs. 2,000 (or Rs. 2,526 according to the owner of the house). The Dacoits were opposed,—that is, the Foujdar, attended by a posse of Police, and by a man blowing a conch, bombastically came to the house *as the robbers were escaping from it*; but the conch-blower alone attacked the robbers. They knocked him down, and made off.

The gang on this occasion, as usual in dacoities by Canara Dacoits, whose chief occupation is to commit burglary, consisted of the several quotas of as many as sixteen Naiks, banded together for the purpose.*

Strength of the gang, consisting of the quotas of sixteen Naiks	65
Approvers under sentence of life transportation	10
Transported for life	27
Deceased	3
At large, including three of the old men mentioned under No. 40 . .	25
Total	65

REMARKS ON DACOITY No. 44.

When the Dacoits proceeded to this dacoity, they found a party of horsemen alighted at the village gate, their horses picketted outside by a temple. The robbers cut the head and heel-ropes, and let the horses loose. Some of them then stood over the temple and gateway, to prevent any attack from that quarter, while the rest proceeded to the doomed house, which they broke

* They commit burglary in small parties of from three to five, and sometimes eight men, under their own peculiar Naik or leader. Occasionally they convert the burglary, when not to be accomplished stealthily, into a declared dacoity with lighted torches ; and when a dacoity on a large scale has been decided upon, several of these small distinct quotas of robbers join together and so form the gang.

into by means of axes in the usual manner, and plundered it of a booty of Rs. 300 (or Rs. 400 according to the owner of the house). Some villagers pursued them, but desisted on two of them getting cut down. An affray also took place between the men at the temple and the Dacoits posted there, and wounds were inflicted ; but all the robbers escaped unscathed.

Strength of the gang, including fourteen Naiks.....	56
Approvers under sentence of life transportation	7
Transported for life.....	20
Deceased.....	3
At large, including two of the old men mentioned under Nos. 40 and 43.	26
Total....	56

REMARKS ON DACOITY No. 45.

In this affair three of the Dacoits got badly wounded. They carried off, however, a booty to the value of about Rs. 700.

Dacoity at Yergoontee, in the Bellary Zilla, by a Gang of Dharwar and Bellary Dacoits.

But for the opposition they met with, they might have obtained a very large plunder, as the house was full of wealth.

Strength of the gang, including seven Naiks.....	35
Approvers under sentence of life transportation	3
Limited imprisonment with hard labour	2*
At large	30
Total....	35

REMARKS ON DACOITY No. 46.

Three dacoities have been committed in this village, now belonging to the Dharwar Zilla. On the occasion here referred to,

Dacoity at Moolgoond, in the Putwurdhun State, by a Dharwar Gang.

the Dacoits seized three or four men they found sleeping at the door of the house, *tied them up in bundles in their blankets, and deposited them in the middle of the street*, one of the Dacoits remaining over them to keep them quiet; the rest of the gang then very coolly went on with the dacoity ! They broke into the house, deprived

* These two men were sentenced to life transportation, but Government commuted the sentence.

the females of their jewels, belaboured the owner of the house with their clubs, and carried off a booty to the value of Rs. 1,000. All escaped.

Strength of the gang, Kaikarees and Wuddurs*	20
Approvers under sentence of life transportation	3
Transported for life	3
Deceased	3
At large	11
Total.....	20

REMARKS ON DACOITY No. 47.

This was upon the house of a 'joolai' or weaver. Two of the Dacoits were shouldered up to the terrace, from where they
 Dacoity at Gooledgood, Bel- gaum, by a Badamce Gang. descended into the house by a staircase, and then opened the door for the rest of their associates, who rushed in with lighted torches, laid hold of the inmates, snatched off from them all their ornaments, and decamped, for they were prevented from getting into the money room, as two men of the house had, on their first appearance, rushed into it, and secured it from the inside, and the Dacoits had not time to assail it, as the alarm had been taken up in the village, and the men posted outside called out to them to hasten out. The robbers retired to their retreat on a hill situated upon the frontier of the Nizam's territories, a spot where they had for years been located, robbing in both countries, always suspected and feared, but never driven away, their clever old leader having always contrived to deceive the District Authorities, and this to such a degree, that whenever any crime was committed in the neighbourhood, often the deed of his own people, *he used to be consulted as to the probable perpetrators!*†

Strength of the gang, Kaikarees, under six Naiks, all belonging to the same colony, which numbered about 50 Dacoits, ‡ under the general leadership of their head man, above alluded to 31

Approvers under sentence of life transportation, including the old Naik adverted to (Dod Sahibya)..... 3

* In the Dharwar country, Korwees (Kaikarees) are occasionally joined by Wuddurs, (quarriers and earth-diggers), a sect of whom are Dacoits.

† His name is Dod Sahibya, and he is now an approver.

‡ A few of these Korwees belonged to the division of the tribe who are ostensibly, and indeed really, *snake-charmers and conjurors*, but secretly they are Dacoits and burglars; and this sect are called *Morikars*, who are also very skilful in passing off coloured brass for gold.

Transported for life, including five of the Naiks	15
Limited imprisonment with hard labour	2
Deceased	2
At large	9
Total....	31

REMARKS ON DACOITY No. 48.

The gang was invited from the upper country by the Sir-Naik of Mhang Ramosees* of the Chiploon Talooka, in the Southern Konkun. The houses attacked were two, adjoining each other. The Dacoits came down from above the mountains by the Bhyroo Ghaut, and returned by the same route, with a very large booty, each man having appropriated whatever he had laid hands on, which is usual among this class of professional robbers. They were not pursued at the time. The booty obtained on this occasion was so heavy (consisting chiefly of cooking utensils) that the robbers *even engaged ten or fifteen 'biggarees' from a village below the Ghaut or pass to carry a portion of it*, to enable them to move quickly, and to reach the upper country of Sattara.

Five or six days subsequently, the Sir-Naik adverted to traitorously came up, with three parties of regular sepoy, and, at Tarlah, caused the seizure of some of the tribe, *who happened not to have had any part in the robbery*; but at the same time he seized also two women, one of whom was the young wife of an influential member of the gang, then himself quite a young man, but afterwards a Naik of great celebrity. He assembled and harangued his people, and persuaded them to venture an attack upon the sepoy, with the view to the rescue of his wife. They consented. The sepoy were encamped at a temple, inside of which they kept their prisoners. The attack took place at midnight. Upwards of one hundred of the tribe, with shouts, rushed upon them with drawn swords. Two of the sepoy were cut down; but the guard kept up a smart fire, which threw the Dacoits back; and as two of their number had been shot dead, and a third badly wounded, the whole made off, without succeeding in their object. The prisoners alluded to were taken to Sattara, and were by the Durbar imprisoned *for one year*. I brought forward this robbery and its consequences but recently, when I commenced operations against this tribe, for the purpose of the conviction particularly of the Naik above alluded to, whose wife was one of those whose rescue was attempted as above. The trial was

* Or village watchmen, called *Rukhwaldars* and *Jaglias*.

beset with difficulties, owing to the time that had elapsed, and to the evidence to the circumstances, proceeding from the Jagheerdar of Tarlah, to summon whom to the Court at Belgaum of the Political Agent Southern Muratha Country was a matter for some consideration, on account of his debility, and great age. Conviction, however, followed, and the Dacoit was transported for life. The gang on this occasion consisted of *twenty-three village watchmen*, under five Naiks; but as operations against these Dacoits have not yet been regularly taken up, owing to a belief that the tribe has very much left off dacoity, the most of them are at large, one being an approver under sentence of life transportation, and six having died.

REMARKS ON DACOITY No. 49.

Although the Mhang Ramoosees have been most determined Dacoits, they have often, at the same time, shown themselves to be faithful guardians of their own villages against Dacoits. On the present occasion the Sir-Naik of Rhymutpoor had, under the orders of the Maharaj or King of Sattara, been very busy in seizing certain others of the tribe of other villages for dacoities. This exasperated them all, and certain leaders of the tribe were determined to be revenged upon him, by committing a dacoity at his village, in order that he and his watchmen might be heavily fined for it by the Durbar or cabinet, in compensation for what they might carry off,—the usual course in the Sattara State whenever a dacoity has been committed at any village; and their wish, also, was to murder him. They came on, accordingly, one night at midnight, in a large body, from fifty to seventy-five in number, but they were nevertheless stoutly resisted by the village watchmen, *themselves Dacoits*. A stand-up fight ensued; about twenty men on the side of the village were wounded, including a man now an approver with me, who was one of the Rukhwaldars or watchmen of the village. Two were killed outright. The Dacoits, however, made off, with a booty, obtained from two houses, to the extent of about Rs. 3,000, but several of them had also been badly wounded. The obnoxious Sir-Naik, on whose account the robbery had been planned, concealed himself during the affray, and so escaped. He informed the Durbar of the leader and instigator of the business, whose name was Gênya Naik. The latter, however, came and surrendered himself to the Maharaj, who not only pardoned him, but at the same time gave him the rukhwālce charge or watch of the whole of the city of Sattara, *a duty he performed very zealously*.

But some time subsequently, a gang of Bhat or Sansiah Dacoits, from Hindoostan, under Grassia Naik, lately an approver in this Office (they have often depredated in the Southern Muratha Country), committed a dacoity, attended, as usual, with murder and wounding, at Sattara, upon the house of a Goozur. They escaped, as usual, to their distant encampment, and the man Gênya, who could give no account of the culprits, got suspected. It was declared that so successful and murderous an undertaking could have been the deed of no one but Gênya! He was tried by the Durbar, upon what evidence I do not know, *but he was hanged for it*. This business is well known among the tribe.

REMARKS ON DACOITY No. 50.

This was the deed of a gang of Sansiah or Bhat Dacoits, belonging to a celebrated female leader, named Tumbolin, who, after her husband, named Chota Johurree, had been hanged for a dacoity in the Madras Territories (at Podéchoor), took his place at the head of the gang. She used not to lead it in person, but she appointed a very old and successful Dacoit, named Himtya, to do so. She, however, used to superintend all the affairs of the gang, and to accompany it upon all its distant expeditions, remaining during the dacoity at the rendezvous.

These Dacoits invariably committed their gang robberies *at nightfall*, so as to have the whole night before them during which to reach their distant rendezvous, from where they pushed on, without halting, except for a hasty meal, to often a hundred and a hundred and fifty miles from the scene of the dacoity.

On the present occasion, the late Captain R. Lewis, of the 22nd Bombay N. I., was the Deputy Military Paymaster at Sholapore, and he and four or five other Officers (Captain Poole, of the 1st Cavalry, Lancers; Morris, of the 9th N. I.; &c.) had but just returned to his bungalow from a shikar party. They were seated in the veranda, awaiting some refreshments. The guard over the treasure had just relieved its sentries, a double sentinel having been posted for the night over the tumbril. Directly the Dacoits, *only sixteen in number*, had perceived this, and that the sepoy of the guard had retired into the guard-room, the man Himtya very composedly stepped forward, *and shut them up in it*, by putting up the chain fastening of the door. At the same moment the two sentries were speared, while another Dacoit mounted upon the tumbril, and, with his axe, broke open one of its compartments. An alarm

was raised, and a sentinel at the quarters in the next compound, of the Officer commanding the Station, fired upon them. Captain Lewis's butler happened at this moment to pass by on his way from the kitchen, with a tray of edibles for his master. A blow was aimed at him with a spear, which missed, and passed between his legs, and he was sent headlong to the bungalow. It was now the Officers above mentioned became aware of the presence of a gang of robbers. They sallied out. One of them discharged his gun at the Dacoits, and, although loaded only with small shot, brought down one of them. In the mean time, the robbers had discovered that they had broken into the wrong compartment of the tumbril,—*the money had, indeed, only that day, by the merest chance, been removed into the other one!*—and as they were now in their turn attacked, "*and by saheb logue too,*" as the approver to this dacoity expressed it, they retreated, carrying off with them their wounded comrade. Immediately, bugles and drums were sounded, and the troops turned out. Videttes, and patrols of cavalry were sent out in all directions, and the Commanding Officer reported next day to the Commander in Chief, that his camp had been attacked by *a numerous and well-organised banditti*, and that he had made every disposition to repel their next attack, which was fully expected! In the morning, the wounded man was found and brought in, but he would disclose nothing. The whole of this gang has, within the last few years, come into the custody of this Department, whether in Hindoostan or of this Agency, and has been disposed of.

REMARKS ON DACOITIES Nos. 51 AND 52.

There were two dacoities at Barsee, committed by Grassia Naik, with his gang of Bhat Dacoits, at an interval of fifteen years. Dacoities at Barsee, in the Sholapore Zilla, by Bhat Dacoits. Both were attended with the murder and wounding of several persons, for it is seldom that the Bhats or Sansiahs fail in perpetrating something of the kind; for when they escape, they do so in a body, and run a muck, spearing any one and every one who should happen to be in their way. The booty on both occasions was valuable. It was Grassia who committed the dacoity at Sattara, for which Gēnya Naik, Mhang Rukhwalidar, was hanged, as adverted to under No. 49. After a lapse of several years, he had appeared down there again, and was planning another robbery at Sattara; when, upon information sent down by the late Lieutenant Colonel Malcolm from Hyderabad (Deccan), he and his people were seized. I myself examined them at Hyderabad in 1847, when he was admitted as an approver.

He told me that he and his gang had, during the previous year, been seized somewhere in Central India, *charged with belonging to the bunder gang of Bombay, and with ship-burning there*, and he asked me what a ship was!

All the Dacoits engaged on the above two occasions have been disposed of by the Department. Grassia died of cholera, when deputed by me with an arresting party into the Nuggur districts.

REMARKS ON DACOITY No. 53. .

This was also the deed of Tumbolin's gang, led by Himtya, who, and another, got seized in the act. It was his last robbery. He was sentenced to five years' imprisonment with hard labour, while his companion was acquitted by having declared that he happened to be a poor labourer, who unfortunately had been passing by the scene of the dacoity, when he was knocked down by the Dacoits; and that when they made off he was seized by the Police, as if he had been one of their number. On the evening of this robbery, almost the whole of the City Police were in another part of the city, attending the procession of the marriage of the Foujdar. The booty the robbers carried off was a valuable one.

Dacoity in the City of Poona.

REMARKS ON DACOITY No. 54.

The gang on this occasion was a small one, of only eight Bhat Dacoits, under another very enterprising leader, named Kunkia. He was the last that extended his depredations so low down in India. From Almilla (a town in the Sholapore Collectorate), he had ready access to the Shorapoor Bedur Province, in which, not far over the border, in a thick date-grove, he had his 'tanda,' or camp. On this occasion, one man of the house was killed, and five wounded.

Dacoity at Almilla, in the Sholapore Zilla, by Bhats.

REMARKS ON DACOITY No. 55.

This dacoity was also the deed of Grassia Naik. It was committed, as usual, at nightfall, within the walled city of Sholapore, upon the house of a wealthy tobacconist. Three Dacoity at Sholapore, by Bhat Dacoits.

men were murdered, and six wounded. The Dacoits escaped; but they have since been disposed of by the Department.

REMARKS ON DACOITY No. 56.

This was Grassia's last feat previous to his arrest at Sattara, as alluded to under Nos. 51 and 52. The dacoity created a great sensation, and was attended by many serious consequences. It was upon the house of three old men, who were brothers, trading under the firm of the "Kurrulgee Sowkars." Five men were murdered, and five wounded by the Dacoits; and among the former was the elder of the three Sowkars, and a son of one of the others. The surviving brothers, upon this, charged the *son of their murdered brother* with the dacoity; for the youth had now become the heir to the estate, and as he had been always obnoxious to them, they declared that he had instigated the deed with the view to his inheriting the property. They had him seized, and his life was in jeopardy in consequence. This on the side of the plundered parties.

On the other hand, however, the Political and Magisterial Authorities, because among the murdered parties there happened to be a person of some consequence in the Southern Muratha Country (the Dessace of Wuttoor), by whose death the succession to that dignity was diverted into another channel, supposed that the dacoity itself was merely a covert act by which his death had been compassed. The deed was therefore, on the side of the Authorities, put down to faction, springing from some alleged political feud.

The facts, however, of the case were, that the Dacoits had no concern whatever in the descent of the Wuttoor family on the one hand, or in the entail of the Kurrulgee estate on the other. Their encampment was far away in another direction, close to the Krishna; and they had but recently come down from the Oude Terraic, disguised as Guzerathee Dombārees, or showmen.

The Wuttoor Dessace happened *by mere chance* to have arrived at Gokak that very evening. He put up, as did his attendants, at a travellers' shed on the other side of the street, opposite to the doomed house; and when the Naik, after he had at dusk collected his men at a preconcerted spot outside of the place (where they had previously buried their weapons), came into the town to buy oil for the torches, and, as was usual, to take the last look at the premises, he perceived that there were travellers at the shed adverted to, who might give trouble. He and his men had come several koss that day for the settled

purpose of committing this robbery, which had been planned fully a month previously, and, moreover, a bad omen, that day met with by the gang when it set out, had been discharmed and converted into a propitious one. The wife of one of the gang had died some days previously, and her obsequies had been carefully performed; but on the morning of its departure, after it had set out for the robbery, a dead body was seen. This boded evil; upon which one of the Dacoits promptly went up to it, and placed his stick against the face of the corpse, when it was declared they might proceed with the enterprise. The Naik was not therefore to be deterred. Arrived at the spot where his men had assembled, and, ready armed, were awaiting his coming, he told off each man to his appointed task, merely remarking to Hurree and three others, who were to post themselves in the street adverted to, that in the shed over the way they would find a man wearing a wide white turban, who, and his attendants, *should be seen to* if they stirred in the matter at all. The consequence was that the man and his companions were murdered outright.

As to the suspected nephew of the surviving Kurrulgee brothers, he was greatly incensed at the prosecution he was subjected to by his two uncles, during which he was in custody for six months! Had they succeeded in it, he would doubtless, as he remarked to me, *have been hanged*; so that when the real culprits were brought to justice by me, he in his turn preferred a charge against them, and against their witnesses, of false imprisonment and conspiracy, and both, with six others, were convicted, and sentenced to imprisonment, with hard labour, for various periods.

The gang escaped, although a party of Muratha Horse was posted at one of the gates of the town.

Seven of this gang were sentenced to life transportation, on committals from this Office, for this dacoity, and the rest have been disposed of by the Department elsewhere; but one of the approvers to the dacoity subsequently escaped from the custody of one of my arresting parties, when on duty in Khandeish.

REMARKS ON DACOITY No. 57.

This was the deed of Grassia Naik, aforementioned. The booty was large, and the Dacoits escaped. They slew one man, and badly wounded three others.

He perpetrated a similar dacoity with a gang of twenty men at Ellichapoor, about the same time, in which seven men were murdered, and one wounded. The booty was Rs. 3,200.

REMARKS ON DACOITY No. 58.

This also was the deed of Grassia Naik, and was committed upon the public treasury, although under a guard of the line. The
 Dacoity at Dhoolia, in Khan- dacoits speared the sentinel, but were opposed by
 deish, by Bhats. the guard, who shot one of them, and wounded
 another; so that they made off, carrying off their disabled comrades. None
 of them were arrested at the time.

A similar dacoity was committed by a gang of these adventurous robbers in the Cantonments of Bolarum, or Elwall, near Secunderabad, in February 1847, when they attacked the house of the Kuzzanchee or treasurer, where was a guard of the Nizam's regular infantry. Some of the sepoy were, as usual, murdered on their posts, and an immense booty was carried off in hard money, to the extent of about Rs. 19,000. This was the deed of Malchund Naik, a one-eyed man, now an approver in the Department. He and his men escaped at the time, as they have always done, except in rare instances, as at Poona (as mentioned under No. 53). The gang numbered twenty-one men.

A similar attack by Bhat Dacoits upon the public treasury took place at Oopwa Ellore, in the direction of Masulipatam, in the Madras Territory, in March 1838, under Kunkia Naik, with a gang of eleven men. The chest was in the charge of a Naique and six sepoy of the 27th Madras Native Infantry. The robbers escaped, after murdering two of the sepoy; but some suspected village people were seized for the robbery, and two of them *were tried, convicted, and transported for life*. On a representation from this Office, they were reprieved. One of them had, however, mean time died. At first, it was hard to believe on the part of the Authorities—to whom it was represented, through this Office, that the deed had in fact been that of some professional Dacoits from Upper India—that *so small a number of men as eleven* could ever dare to assault a guard of a Naique and six privates of the line!

A similar dacoity was committed in the Military Cantonments of Jaulnah, upon the treasure chest of the Military Paymaster. The sentries had just been posted, and the men of the guard, relieved from being under arms at sunset, were, as usual at that hour of the evening, sauntering about listlessly. A few were lying down in the tent, in front of which their arms were piled. The sentries were suddenly speared, and the whole of the muskets lifted up, and thrown into an opposite prickly-pear hedge. Some of the Dacoits, with spears, then immediately stood over those of the guard who were in the tent, while the chest was being broken open, from which cash to the extent of nearly Rs. 8,000 was plundered by the Dacoits. One of the Dacoits was carried off wounded. This was in 1828.

KEMARKS ON DACOITY No. 59.

This was the deed of a very notorious Bhat or Sansiah leader, named Nawab, who, for a dacoity in the Madras Territories (at Bellary), was afterwards transported for life. Three men of the village were murdered, and one wounded, and a booty of Rs. 5,000 carried off.

Dacoity at Nundgur, in the Belgaum Collectorate, by Bhats.

REMARKS ON DACOITY No. 60.

This was upon the bazar attached to the camp of the force under Sir Thomas Munro, on his return from the storm and capture of the fort of Sholapore. It was the deed of the gang belonging to the woman Tumbolin, in the life-time of her husband Chota Johurree, by whom it was conducted. The booty was to the extent of Rs. 7,000.

Dacoity at Nepanee, &c. in the Belgaum Zilla, by Bhats.

The same gang had before this committed a similar successful dacoity in the camp of the same Officer, when halted at Kulludghee, on which occasion they fired the bazar.

In 1818, when General Sir James Keir invested the fort of Rairee, near Vingorla, the same enterprising Dacoits attacked, with similar success, his bazar at that place; also the bazar of a reinforcement of troops from Madras, under Colonel Dowse, when halted in the Amboolie Pass, near Belgaum.

REMARKS ON DACOITY No. 61.

This, too, was the deed of Nawab Naik. It was committed upon the goods of some travelling merchants, who had alighted for the night close to the chowree (village police station). Seven men were speared, and one murdered. The booty was about Rs. 1,100.

Dacoity at Dhoonsee, in the Hooblee Talooka of the Dharwar Collectorate, by Bhats from Hindoostan.

REMARKS ON DACOITY No. 62.

This was committed upon the premises of a very thriving firm of Native bankers, in June 1845, and was the deed of Kunkia Naik, before alluded to, who, as he was short of hands, was assisted on this occasion by a quota of *Lumbanees* from Talikote. The booty, consisting of gold twists, &c. was to the extent of Rs. 9,000. The old Sowkar (Juggonath-

Dacoity at Bagulkote, in the Belgaum Collectorate, by a joint Gang of Bhats and Lumbanees.

dass) was murdered, as also was his young grandson and heir, and another man outside of the house; and four men were wounded. The information regarding the premises was, on this occasion, obtained by the Naik Kunkia, by his taking a few rupees of some other currency early one morning to the old shroff, and asking him at what discount per rupee he would exchange the same for Bagulkote currency. The shroff offered less for them than the Dacoit pretended was enough, and he purposely set up an altercation with the old man, who haggled for a bargain of about an anna per rupee less than the Naik said he wanted. At length the robber pretended to be satisfied; upon which the old man went into one of the rooms of the veranda, and brought out a bag of money. The Dacoit knew from this that that room was the depository of the man's wealth. This is the usual way according to which Bhat Dacoits obtain their information of the premises they wish to attack. At the time of the dacoity, the old man stood up against the door of that room, to prevent the robbers from breaking into it, and he was murdered in consequence, and his grandson also. Two of this gang were, on a committal from this Office for this and the subsequent dacoity at Gudduk, hanged at Dharwar. They were both very desperate characters, and had never engaged in a dacoity without committing murder. One of them was the man who mercilessly killed the young lad as above.

REMARKS ON DACOITY No. 63.

This was the last dacoity that was committed by Bhats in Southern India, or rather within the jurisdiction of this Agency.

Dacoity at Gudduk, in the Dharwar Collectorate, by Bhats and Lumbanees.

It also was the deed of Kunkia Naik, joined by some Lumbanees, as before at Bagulkote. It created a great stir, and Sir George Clerk, at that time Governor of Bombay, was very severe upon the District Authorities in his remarks respecting it. People were seized for it in all directions, and among them *a large number of Kulhorwee dacoits*,* who, however, were not concerned in this robbery. The Dacoits murdered three men, and wounded two others. Their booty, however, was small. My duties had then but lately been extended to the suppression of dacoity. Fortunately, I obtained a clue to the perpetrators, and acted upon it at once; and in the neighbourhood of Talikote,† to which I proceeded from Belgaum by express with a party of Nujjeebs, we seized the whole gang, with a portion of the booty, and it was then I discovered who were the delinquents in the Bagulkote and other previous

* At that time unknown to be professional Dacoits.

† Distant about a hundred and fifty miles, and near Shorapoor Bedur.

serious dacoities, for Kunkia saw that it was all over with him, and so offered to turn approver. The plundered party had, however, declared to the District Authorities *that he had not been robbed of anything*; for he was a pawnbroker to a large extent, and feared that a general demand might be made upon him for goods that had been pledged to him. Hearing, however, that even the stolen property was in my possession, he consulted a reverend German missionary, located near Gudduk, and, by his advice, admitted his former falsehood. But for this, the prosecution might have failed; and as it was, I did not succeed in prosecuting to conviction the Lumbanee portion of the gang, but only the Bhats, and a receiver of some of the plunder. Kunkia I admitted as an approver; two of his gang were, as I have said, hanged. The Bhats now ceased from extending their excursions to this part of India; at any rate they have not committed any dacoity since the above event, in any portion of the circle of the superintendence of this Agency.

REMARKS ON DACOITY No. 64.

The Dacoits tried all their might to break through the door of the house, but it resisted their efforts; whereupon some of them climbed up to a window high up in the wall, through which they got down into the house, but perceived that, even then, there was no way of getting to the inhabited part, where, in an upper story, they knew all the property to be deposited; so that as the alarm, too, happened to have been taken up in the village, they were obliged to decamp, without any booty. No one was seized.

Strength of the gang, Kaikarees	10
Approvers under sentence of life transportation.....	4
Transported for life	3
Deceased	2
At large.....	1
Total....	10

REMARKS ON DACOITY No. 65.

The road to the village where this dacoity was committed was obstructed by a creek. This the robbers crossed during the day in a ferry-boat. At night, they went up to the house, posted the watches, lighted their torches,

Dacoity at Ugsée, in the Goa Territory, by a Rutnagherry Gang.

and, with hatchets, broke into it, but they got a booty to the value of only Rs. 30. The owner of the house, and also one of the Dacoits, were wounded in this robbery. All escaped; but, owing to the creek, they took the road to Goa, and escaped round by it.*

Strength of the gang, Kaikarees	8
Approver under sentence of life transportation	1
At large	5
Deceased.....	2
	<hr/>
Total....	8

REMARKS ON DACOITY No. 66.

This was a robbery in the camp of some regular troops marching to Sholapore from Bellary. The Dacoits were discovered by one of the sentinels, and so obtained but a small booty.

When the consequent hubbub ceased, and all had become again hushed, the Dacoits a second time stole into the camp, at another point, where they belaboured with clubs some men who would have given the alarm, and carried off a saddle-bag. As they were making off with it, they were obstructed by falling in the dark upon some other men lying asleep, by whom they were at once opposed, but the Dacoits lifted whatever they could lay hands on, cut down one of their opponents, and made off. Their booty amounted in value to Rs. 125.

Robberies of this nature used to be of frequent occurrence in the camps of troops, while marching through the Sholapore Zilla; *and on one occasion the Commanding Officer's flag was carried off by the Dacoits!*

Strength of the gang, Kaikarees	9
Approver under sentence of life transportation	1
Deceased	3
Transported for life	3
At large.....	2
	<hr/>
Total....	9

(Signed) C. HERVEY, Captain,
Assistant General Superintendent.

*Assistant General Superintendent's Office,
Coorla, 1st April 1856.*

* These Dacoits have often depredated in the Goa territory, as at Mhopsa, Rye Bunder, Panjim, &c.

CORRESPONDENCE RELATING TO ACT No. XXIX. OF 1850.

No. 2060 OF 1856.

JUDICIAL DEPARTMENT.

To the REGISTRAR OF THE SUDDER FOUJDAREE ADAWLUT.

SIR,—In transmitting to you extract paragraphs 24 to 28 of the Annual Report of the Assistant General Superintendent of the Operations for the Suppression of Thuggee and Dacoity, with the Appendix A therein referred to, I am desired by the Right Honorable the Governor in Council to request that the Judges of the Sudder Adawlut will be good enough to favour Government with their opinion as to whether any alteration of the law is necessary to enable the executive effectually to deal with the crime of Bhar swindling.

I am also instructed to forward paragraphs 34 to 37 of the Report, and to request that the Judges will favour Government with their opinion on the question raised by Captain Hervey as to the propriety of converting Act XXIX. of 1850 into a general Act.

I have the honour to be, &c.

(Signed) H. L. ANDERSON,
Secretary to Government.

Bombay Castle, 17th June 1856.

No. 2061 OF 1856.

JUDICIAL DEPARTMENT.

To the COMMISSIONER OF POLICE.

SIR,—In transmitting to you extract paragraphs 34 to 37 of the Annual Report of the Assistant General Superintendent of the Operations for the Suppression of Thuggee and Dacoity, I am desired by the Right Honorable the Governor in Council to request that you will be good enough to favour

Government with your opinion on the question raised by Captain Hervey as to the propriety of converting Act XXIX. of 1850 into a general Act.

I have the honour to be, &c.

(Signed) H. L. ANDERSON,
Secretary to Government.

Bombay Castle, 17th June 1856.

No. 855 OF 1856.

From the COMMISSIONER OF POLICE,

To the JUDICIAL SECRETARY TO GOVERNMENT,
Bombay.

SIR,—In reply to your letter No. 2061, of the 17th instant, I have the honour to state, that it is reasonable to suppose only a very small proportion of cases of poisoning by datura are reported.

2. In at least nine cases out of ten, the traveller must be out of reach of medical aid, as in ordinary thuggee a secluded spot would be selected, and care taken to escape notice. The symptoms presented to the ordinary observer would, I believe, be attributed to *coup de soleil*.

3. Inquiries which I have caused to be made in some cases of this description have had no result, beyond leaving on my mind a strong suspicion that *coup de soleil* often means datura.

4. Captain Hervey reports forty cases, death occurring in nine instances. In six cases ten persons were punished. I beg particularly to draw the notice of Government to the fact that in all the cases attended with death the culprits escaped; in the cases of conviction, the inadequate sentences awarded for this atrocious crime cannot fail to attract the notice of Government. With such results, it is clear that the law at present is inoperative. I entirely concur in the opinion submitted to Government that Act XXIX. of 1850 should be made a general Act. Its present limitation under Section II. of Act XXXI. of 1838 prevents its operation in the Mofussil, where it is most needed. The crime is one which demands the most stringent measures, and severest punishment, for its suppression.

I have the honour to be, &c.

(Signed) A. BETTINGTON,
Commissioner of Police.

Sattara, 19th June 1856.

Its effectual suppression demands the agency of the Thuggee Department, and the aid of approvers.

(Signed) A. BETTINGTON,
Commissioner.

No. 2212 OF 1856.

JUDICIAL DEPARTMENT.

TO THE REGISTRAR OF THE SUDDER FOUJDAREE ADAWLUT.

SIR,—In continuation of my letter of the 17th instant, No. 2060, I am desired to forward, for the consideration of the Judges of the Sudder Foujdaree Adawlut, an original letter from the Commissioner of Police, reporting on the question raised by Captain Hervey as to the propriety of converting Act XXIX. of 1850 into a general Act.

2. You are requested to return the letter herewith sent with your reply.

I have the honour to be, &c.

(Signed) H. L. ANDERSON,
Secretary to Government.

Bombay Castle, 25th June 1856.

No. 1663 OF 1856.

TO H. L. ANDERSON, Esq.,

Secretary to Government, Judicial Department.

SIR,—I have the honour, by direction of the Judges of the Sudder Foujdaree Adawlut, to acknowledge the receipt of your letter *Present*,—W. E. Frere, W. H. Harrison, and R. No. 2060, dated 17th ultimo, forwarding, for the Keays, Esquires. opinion of the Court, extracts from the Annual Report of the Assistant General Superintendent of the Operations for the Suppression of Thuggee and Dacoity, suggesting an alteration in the law, to enable the executive effectually to deal with the crime of Bhar swindling, and the propriety of converting Act XXIX. of 1850 into a general Act.

2. In reply, I am directed to state that Captain Hervey's letter of the 22nd January last (Appendix A) leads the Court to the belief that what he would advocate is, not a new Act to meet cases of obtaining property under fraudulent pretences, so much as some modification of the law of evidence, by which

more weight might be attached to the depositions of approvers. If that be the case, the Court, I am desired to state, are not prepared to support it, nor do they think any alteration in the law necessary.

3. Captain Hervey mentions three cases of swindling by Bhar,—one of a rich, covetous Sowkar, whose name he does not mention; the other that of Gopalla Malce at Poona; and the third the Mhopsa case. It appears to the Court that, in all of these, the complainant and injured man had lent himself to what he must have known was wrong: they all went to obtain hidden treasure; and much though one might pity their weakness, and heavy though the punishment has been, it is impossible to say that they did not bring it upon themselves.

4. Cases, however, of this kind, appear to the Court to be really cases of conspiracy; they are offences which a man cannot carry out single-handed, and there ought not to be much difficulty in proving them, if the dupes would but come forward. This, however, Captain Hervey says they will not do; and if they do not, the Court are not prepared to give to approvers' evidence and confessions more weight than they do now, to screen the victims of the conspiracy from exposing their own folly. The punishment, too, for conspiracy (ten years' imprisonment), is, the Judges think, quite heavy enough for any of these cases.

5. As regards that branch of Captain Hervey's Report which refers to passing the Chowkoonee Rupees, of which the Court lately had a case* before them from Poona, the sufferers are probably more to be pitied, and the Court would be very glad to see the want (which they have long regretted) in our Criminal Code supplied, of an Act to punish cheating, and obtaining property by false pretences.

6. The Court are of opinion that nothing would be gained by a law making the coining money other than the current coin penal, for people would then cheat with false jewellery, as they now do with false coins.

7. Having thus given their opinion against the proposal generally, the Court desire me to add that they cannot see what object Captain Hervey expects to gain by converting Act XXIX. of 1850 into a general Act; for it appears to them, that as far as the Datura Thugs, as the Assistant General Superintendent calls them, are concerned, ten out of fifty people taken up on suspicion have been punished in the Mofussil, while of eleven taken up for the same offence in Bombay under Act XXIX. not one was convicted; and, upon looking at the Criminal Report for last year, the Court see that out of six people taken up for thefts by administering poisonous drugs, four were convicted and two

* Page 547 of Morris's Reports for April last.

acquitted in the Mofussil, which is a much larger proportion than Captain Hervey shows. It is true that the punishment under Act XXIX. may be transportation, but, unless the offence became much more general than Captain Hervey shows it to be, the Court do not think he would ever find a convict transported unless death was the result of the poisoning, and then the case would most probably be treated as murder. •

8. Since the receipt of the Court's orders to communicate to you the foregoing remarks, I have laid before the Judges your letter No. 2212, dated 25th ultimo, forwarding for their consideration an original letter from the Commissioner of Police, reporting on the question raised by Captain Hervey regarding Act XXIX. of 1850. In returning, as desired, this communication, the Judges direct me to say that they can find nothing in Mr. Bettington's remarks to make them alter the opinion which I have above submitted. Mr. Bettington complains that none of the more serious cases have been proved, and that in those cases in which there were convictions, the punishment was inadequate. But this, the Judges need hardly say, is not the fault of the law, but either of the Police for not procuring sufficient evidence, or of the Magistrates and Session Judges for not convicting when they have a case proved before them, and, when they do convict, for not giving sufficient punishment. Making Act XXIX. of 1850 general will not, therefore, remedy this.

9. Mr. Bettington advocates the extension of the Act to the Mofussil, because the crime is one that demands stringent measures, and the severest punishment, for its suppression. Here the Court desire me to state that the Act merely declares that persons administering poison with intent to do harm, &c. may be transported, and that four years' imprisonment is the minimum punishment; and if they be charged with having administered poison with intent to murder, and it amount only to an intent to harm, they may be punished; but it provides no stringent measure for the suppression of the crime, nor more severe punishment except transportation, than might be inflicted under the present law; and if the virtue of the Act may be judged from the result of committals at the Presidency, as noticed above, the law is inoperative, no conviction ever having been obtained here.

10. The Agency of the Thuggee Department and approvers may greatly assist the Police, as suggested by Mr. Bettington; but the Court cannot say that they have found these agents of much assistance towards arriving at convictions.

I have the honour to be, &c.

(Signed) M. A. Coxon,

Registrar.

Bombay, Sudder Foujdaree Adawlut, 16th July 1856.

No. 2176 of 1857.

JUDICIAL DEPARTMENT.

To Captain C. HERVEY,

Assistant General Superintendent of the Operations for the
Suppression of Thuggee and Dacoity.

SIR,—Your suggestion as to the propriety of converting Act XXIX. of 1850 into a general Act, and of altering the law to enable the executive effectually to deal with the crime of Bhar swindling, having, as already intimated to you, been referred to the Commissioner of Police, and Judges of the Sudder Adawlut, I am desired to forward to you copies of their replies (Registrar of the Sudder Adawlut, dated 16th July 1856, No. 1663; Commissioner of Police, dated 19th June 1856, No. 855), for any remarks which you may wish to offer on them.

2. The disposal of these letters has, I am desired to add, been deferred, owing, first, to your absence on furlough to Europe, and subsequently with the Field Service in Persia, as His Lordship in Council was desirous of being favoured with your remarks previous to disposing of the subject.

I have the honour to be, &c.

(Signed) H. L. ANDERSON,
Secretary to Government.

Bombay Castle, 2nd July 1857.

No. 90 of 1857.

THUGGEE AND DACOITY DEPARTMENT.

From Captain C. HERVEY,

Assistant General Superintendent,

To H. L. ANDERSON, Esq.,

Secretary to Government, Judicial Department, Bombay.

Dated Belgaum, 22nd September 1857.

SIR,—I have the honour, with reference to paragraph 2 of your letter under date 19th ultimo, No. 2817, to reply to your former letter, dated 2nd July last, No. 2176, relating to the crimes called Datura Thuggee and Bhar Robbery.

2. The inquiry having arisen from my statements regarding those crimes in my Annual Report for 1855 (No. 61, dated

Datura Thuggee, or the Crime of Robbery by administering deleterious Drugs.

1st April 1856), and as, with respect to that of *Datura Thuggee, or robbery by administering poison*, I adverted in paragraph 34 of that Report*

to what I said had in another General Report been advocated by me as to the propriety of converting Act XXIX. of 1850 into a general Act, I may be permitted, as the question would seem to be about to be reconsidered, to lay before Government the whole of my remarks upon it, as contained in that General Report (A in Appendix). I therefore venture to submit, accordingly,

Extract paragraphs 14 and 15, and paragraphs 42 to 44, from a General Report from Captain C. Hervey, Assistant General Superintendent, to the General Superintendent, No. 14, dated 22nd January 1856. (See A in Appendix.)

the extracts from it noted in the margin, presenting, as they do, a full review of all that had hitherto been said on the subject. These remarks will, I hope, be found to meet, in a great measure, the objections of the Judges of the Sudder Foujdaree Adawlut, as conveyed in the letter to your address

from their Registrar, No. 1663, dated 16th July 1856, of which you furnished me with a copy.

3. I represented in my Annual Report for 1855, paragraph 37,† that the special Act XXIX. of 1850 barely met—that indeed it did *not* meet—the crime, even in the jurisdiction to which its provisions were limited, viz. the circles of Her Majesty's Courts of Justice in India; and, quite in concurrence with that opinion, the Judges have stated, in their Registrar's letter, that “if the virtue of the said Act was to be judged from the results of committals to the Supreme Court at Bombay, the law was inoperative.”

4. This, then, would present prominently for consideration, the cause to which such results are to be attributed; and it may be found to lie, in conjunction with all that has been advanced by me in respect to the nature of this crime in the documents now forwarded, in the very fact, I most respectfully submit, pointed at by the Judges themselves in paragraph 8 of the Registrar's letter, namely, in their words, that “the Police did not procure sufficient evidence.”

5. The Judges would urge that the law for the suppression of poisoners, as obtaining in the Mofussil, would not be at fault, “if sufficient evidence were brought up by the Police, and if Magistrates and Session Judges convicted and sufficiently punished the culprits.” It is almost admitted by them, by the context, that such are not the results generally of any proceedings, according to the present law, against criminals of this particular class; while it has been my endeavour to show, throughout my reports regarding them, that such results, except in extraordinary instances, are not indeed attainable.

6. The Commissioner of Police has, in his letter to Government No. 855,

* Vide page 27.

† Vide page 28.

dated 19th June 1856, a copy of which was furnished to me with your letter under reply, correctly summed up, from the substance of my Report to you No. 61 of 1856, that from forty cases of the crime, death ensued in nine instances, and that in six of the cases ten persons were punished; and he particularly begged Government to notice the fact, *that in none of the cases in which death ensued were any culprits punished*; and that in those cases where conviction was arrived at, the sentences were inadequate. He added, that it was clear that the law, as it at present stood, was inoperative; and he entirely concurred in the opinion submitted by me, that Act XXIX. of 1850 should be converted into a general Act. This *resumé* of my Report may be considered to contrast favourably with that presented in paragraph 7 of the Registrar's letter already referred to.*

7. I do not perceive, then, that I can add anything more to advance what I have so often advocated for the easier suppression of the crime. The subject is almost exhausted; and I have but little further to offer in support of the cause,—a cause, obviously, of simplicity against craft; of security, and life itself, against certain robbery and probable destruction.

8. In former reports I have illustrated the necessity of the measure I suggest: the suggestion has not been adopted—the evil remains comparatively unchecked; and thus furnishes me with another painful instance of the want of some special legislation, to crush if possible, or at least to curb, the growth of this heinous crime.

9. On the 19th of February last, the dead bodies of two boys, aged six and ten years, were discovered in a tank near the village of Panceguttee, in the Bunkapoor Talooka (Dharwar); and lying near the spot were found four other human forms, senseless, but still breathing; namely a man and three women, one of whom was the mother of the two deceased lads. Restoratives having been applied, sensation and memory slowly returned, and the victims thus rescued from death were able, by degrees, to recall the circumstances that had proved fatal to the children, and well-nigh hurried themselves also to eternity. They had been to a fair at Hoolgoor, decked out, we may conclude, in their family trinkets and holiday garb, and, while there, they were accosted by three Mussulmans, perfect strangers, who ingratiated themselves so much into their confidence, by their praises of the boys, and pleasing ways, that they escorted them through the fair, and even invited them to dine with them at the neighbouring village. Whatever the females may have thought of their offer to them of money (as stated in the report), certain it is that the whole of the party were simple enough to accept the invitation, without any suspicion of their intentions.

Crime Report from the Superintendent of Police of Dharwar, No. 7 of 1857.

They all partook of the little feast prepared for them by the gallants—some rice and curry. The rest was but a dream; for, deposed the survivors, they shortly afterwards became insensible. The Police Superintendent reported that, on a full inquiry, it was found *they had been drugged*. The murdered children had also partaken of the drugged meal. Of the ornaments on their persons, and other property, not a trace remained. The robber-assassins escaped; they have not yet been detected.

10. It may, however, still be argued, that poisoning is rare in the districts of this Presidency. But I have often represented to Government, what I would still humbly do, that the apparent infrequency of the offence is not a test of its limited extent; *that it is committed oftener than is reported*. I do not here enter into the reasons; they are shown in the accompanying documents. It should seem not unreasonable to infer, from the circumstances of the case just brought to notice, that the perpetrators of it were adepts in this villanous profession: Was this the only instance of the commission by them of the offence? Was each instance detailed in the documents, herewith presented, but a solitary and incidental case, under strong temptations for its commission,—by, in fact, but unpractised people? Was the individual who drugged the two men near Malwan, and so murdered one and robbed both, in the case quoted at page 42 of Vol. I. of the Selections from the Records of Government in the Police Branch of the Judicial Department, but a raw hand, thitherto unsteeped in similar villany? May men so stealthy in their ways, apparently so frank in their manner, and yet so intent upon their purpose, so sure in administering the poisons, be regarded as mere novices at the crime, rather than as confirmed offenders? Such a conclusion is opposed to all reason and experience: not only does each case display the dexterity and artfulness of the *friend* by whom the victims were beguiled, but is stamped with indications of practised knavery; while each lamentably presents the real simplicity of the deluded parties—the horror and terror of the survivors on discovering how they had been victimised, how nearly they had died.

11. Presenting the importance of the question in such a form for the consideration of Government, I can more confidently affirm that the diffusion of the crime has remained undiscovered even where its practice has been known. In an incomplete tabular statement received in this Office from the Commissioner of Police, it is gathered that but six cases of the offence took place in the Tanna Collectorate in 1850 and 1851, whereas twenty cases were reported by me; and while but one instance is shown in it to have occurred in the Belgaum Collectorate during the preceding twenty-eight years (1824 to 1851), I have presented to Government, in a former Report, how twenty-four cases,* of occurrence but during the last three or four

* Vide in the Appendix, page 124, paragraph 25.

years of that period,* had been investigated by me as the deed of but a single gang of poisoners, *of which only five instances were known to the Police, or had been reported*; and while the tabular statement exhibits a blank return for thirty-two years in the Ahmednuggur Collectorate, which, in the absence of any mention of the Nassick portion thereof, includes, we may suppose, the return for that Sub-Collectorate, my reports show an instance within it in 1850-51, one case in 1852, three in 1853, three in 1854, and nine in 1855; while the extracts in the Appendix from the criminal reports from the Superintendent of Police of Nassick give the details of two distressing instances out of those included for the years 1853 and 1854.† The returns for the other districts display, it would seem, similar inaccuracies, as may be viewed below. Yet these discrepancies may after all, in the opinion of some, present but very insignificant data upon which to found, it may be said, a proposal for the alteration of the existing law! We do not, however, know the real extent of these dark misdeeds; and I firmly believe, that if a scrutiny were made, in each Zilla, of the number of the instances known to have taken place, even if it were very difficult to ascertain how often the crime was really committed, there would be disclosed a wonderful disparity between what notoriously occurred, and what was made known to the local Authorities.

Collectorate.	According to the Tabular Statement, Total Number of Cases of Poisoning from 1824 to 1856, or during <i>Thirty-two Years.</i>	According to Captain Hervey's inquiries, Total Number from 1850 to 1855, or during <i>Six Years.</i>
Tanna	24	34
Angria's Colaba	No return made	4
Poona	Ditto	15
Ahmednuggur (and Nassick).....	Nil	17
Khandeish	No return made	14
Rutnagherry	Ditto	2
Belgaum	3	9
Jagheer States, Southern Muratha Country	No return made	2
Dharwar	Ditto	16
Sholapore	2	8
Akulkote.....	No return made	3
Ahmedabad.....	Ditto	No inquiry made.
Surat	2	6
Kaira	Nil	No inquiry made.
Broach.....	No return received	Ditto.
Kolapore.....	Ditto	2
Sawunt Waree.....	Ditto	3

* Of these, 14 occurred in the Belgaum Collectorate; 2 in the Dharwar Collectorate; 7 in the Jagheer States; and 1 in the Canara Districts; making a total of 24.

† Vide pages 127 and 128.

12. In conclusion of this subject, I have now only to submit that my object for proposing that the territorial scope of Act XXIX. of 1850 should be extended to the whole of India was, as stated to Mr. Secretary Erskine in my letter on the subject No. 56, under date 24th April 1854 (copy submitted in the Appendix, and marked **B**), and again noticed in paragraph 52 of my General Report,* that the operations of this Agency, if extended to the particular class of criminals aimed at by that Act, might be very much facilitated,—that, in fact, *the Department* might be enabled to take up proceedings against them with a prospect of success. For, as the Act provides a sentence of transportation for life, approvers could, under such a sentence, be admitted with some certainty of that trustworthy and steady evidence being elicited from them, that is not otherwise to be attained from an approver, who, under any limited sentence, has the prospect before him of liberation on its completion. And further, that the most of the culprits convicted on a charge under that Act might accordingly *be rendered impotent for future mischief*—a provision not compassed by the ordinary Mofussil law. Thus, as also advocated by the Commissioner of Police in his letter to your address No. 855, under date 19th June 1856, “the effectual suppression of the crime would be secured by the Agency of the Thuggee Department with the aid of approvers.” For although the Judges of the Sudder Foujdaree Adawlut have, in reply to that suggestion on the part of the Commissioner of Police, been pleased to observe that “they could not say that they had found those Agents of much assistance in arriving at convictions,” it is certain that through their exertions, and by their testimony, convictions have nevertheless been largely attained, and crimes of great magnitude put down, which unhappily, under other agency, and the operation of the ordinary laws, with their rigid requirements in point of testimony, a great suffering community could not before be freed from.

13. I have now to report upon the remaining subject of your letter,—an alteration in the law to enable the executive to deal effectually with the crime of bhar robbery.

Bhar Robbers.

14. The Judges of the Sudder Foujdaree Adawlut have on this subject, in their Registrar’s letter to your address, No. 1663, dated 16th July 1856, paragraph 2, correctly concluded that my aim was not so much to obtain a new law to meet cases of this kind, as some modification of the law of evidence, *by which more weight might be attached to the testimony of accomplices.*

15. In the extracts from my General Report to Major Sleeman, upon which the Judges founded this observation, I suggested, under paragraph 37,† whether this particular class of criminals should not be recognised under the

* Vide post in Appendix A, at page 133.

† Vide page 41.

provisions of Act XI. of 1848, according to which "more weight might be attached to the evidence of accomplices, than which, in such confederacies, there was seldom any better to be obtained"; aware, I stated, as these cautious swindlers were, "what in our Courts of law would, under ordinary circumstances, be sufficient for their conviction; the greatest drawback to any general combination for their suppression being the extreme reluctance with which the duped parties come forward with their evidence against the delinquents."

16. Mr. J. D. Inverarity, when Political Agent for the Southern Muratha Country, in his letter to Government on this subject, as quoted in my Report to the General Superintendent, could not, with the Judges of the Sudder Foujdaree Adawlut, look upon the deeds of a people so systematically employed, as these robbers were shown to be, as comprehended under any denomination of simple robbery. He submitted that "if systematic and professional robbery was dacoity, their acts constituted cases of dacoity, accomplished, not by violence, but by deception and address."

17. And as, in accordance with the subsequent commands of the Judges, the cases of a large gang of these impostors were tried on charges of *conspiracy*, the trying authority, Mr. A. Jones, Session Judge of Dharwar, in his finding on one of the cases so committed to his Court,* remarked, that, in the case before him, *as in the others*, the Vakeel contended "that the charge would not stand against the prisoners, as, allowing the facts to be proved, they constituted a robbery, and not a conspiracy." Mr. Jones added his opinion that, as the law stood at present, conspiracy was, however, the proper charge: "at the same time, the Session Judge cannot but record his opinion also, that it appears to him it would be far better that an Act should be passed, providing for the punishment of acts of fraud or swindling, such as the prisoners are now charged with, which are neither exactly breaches of trust, nor yet robberies."

18. Upon the whole, however, my own opinion is founded on the fact that, although in practice they are both systematic and professional, the people under inquiry are not hereditary robbers, that when the necessary amount of technical evidence can be adduced to prove any specific instance of the crime, they should be tried under the ordinary law; but that when there is not that evidence, they should be tried under Act XI. of 1848, *aided, however, in either case, by the testimony of accomplices*, which I have shown to be indispensable in such cases; the admission whereof should be regulated by

* Case No. 101 of the Dharwar Calendar for 1855. (Vide Morris's Reports, Vol. VII. pages 88 to 92.)

some special new law, and not guided simply by the rules that determine what evidence is receivable in the Regular Courts; rules which, as has elsewhere been appropriately remarked,* “exclude much information, that would be quite sufficient to determine the conduct of any reasonable man, and which at every Sessions save scores of men firmly believed to be guilty.”

19. By the above, I point only to the *Regulation* which, in the ordinary course of criminal law, as obtaining under this Presidency, is not only opposed to the admission of the evidence of an accomplice, but in practice positively prohibits it; as, for instance, in the cases of the numerous Dacoits tried at the Dharwar Sessions in 1851 and 1852, on committals from this Office, the whole of whom were, upon the evidence of approvers, found guilty by the Session Judge, and sentenced to transportation for life. The convictions and sentences in those cases were annulled by the Judges of the Sudder Fojdaree Adawlut, and the prisoners liberated. But on their being retried, upon the same evidence, in a Non-Regulation Court, and being again found guilty and similarly sentenced, both sentences and convictions were confirmed by Government.

20. The defect, if I may be permitted so to term it, in the Regulation that I have adverted to, has, in some measure, been repaired by Clauses XXVIII. and XXXI. of Act II. of 1855, entitled “An Act for the further Improvement of the Law of Evidence.” But as, with reference to the requirements of this Department in its operations against all such extraordinary criminals as those who form the subject of the present inquiry, some further alteration is needed, by which the evidence we are able to adduce may be accepted in Mofussil Adawluts, and thereby be avoided the necessity that now exists for committing our cases exclusively to Non-Regulation Courts, I may, in quoting below the observations of a learned Judge (Mr. Justice Coleridge) on the subject of the evidence of an accomplice, solicit, as I respectfully do, the attention of Government to a former letter from me on this subject to Mr. Secretary Erskine, No. 54, dated 22nd April 1854, a copy of which I annex,† when it was contemplated to repeal Clause 2nd, Section XXXV. Regulation XII. of 1827 of the Bombay Code, as furnishing, perhaps, for consideration, some new feature in any deliberations consequent upon the proposal to the Legislative Council of India, to amend the law of evidence as to the testimony of accomplices, as announced in a Resolution of Government, No. 3567, dated 14th October 1850; the principle having been laid down and recognised in successive instances,‡ that in the absence of any positive rule of law on the subject, a conviction may be arrived at upon the evidence of *an accomplice*

* Macauley.

† Vide page 141.

‡ Per Lord Denman, in the *Queen vs. Hastings*, and other authorities quoted in “Taylor on Evidence,” page 778, S.S.

alone, even in a capital case, *without any confirmation of his statement*, when recourse to such evidence becomes essential, from the necessity of bringing great offenders to justice,—even although accomplices be stigmatised as “usually interested, and always infamous witnesses” :—

In the case of the *Queen vs. Andrews*: “The necessity for the confirmation of an accomplice has been stated too strongly in some cases.” “It appears to me that even the testimony of an accomplice, though entirely unconfirmed, must go to the jury, accompanied, of course, by such recommendations as the Judge in such cases would feel it his duty to make.” “If a witness be admissible at once, I have no right to withdraw his testimony from the consideration of the jury, and the law having admitted the evidence of an accomplice, it is the province of the jury to determine its value.”

21. To return, however, to the subject that has led to the preceding observations, namely, the difficulty in disposing of cases of robbery by *bhar*. The Judges of the Sudder Foudjaree Adawlut have, in the Registrar’s letter, paragraph 4,* reiterated their opinion, that such cases can be tried only as cases of *conspiracy*; they are not disposed to support any modification of the law as advocated by me, by which greater weight might be given to the evidence of accomplices, because, they observe, “there ought not to be much difficulty in proving the offences, if the dupes would come forward”; which, if they abstained from doing, the Judges, on the ground that the injured parties had lent themselves to what they knew was wrong,—had brought upon themselves, by their own act, the losses they had sustained,—were not prepared to extend the aid sought by me for ensuring the punishment of the delinquents,—“to screen thereby their victims from exposing their own folly.” To this I would observe, and with perfect deference, that as it is the practice, on the occasion of any great public offence, to prosecute the criminals on the part and in the name of the State, in the absence even of complainants, it would, for the sake of the protection equally of every one against an acknowledged evil, manifestly be but a public duty, in cases like the present, even although it might involve restitution and justice to but persons who may themselves have been blameable in the transactions out of which arose the wrong, to provide nevertheless for the punishment of the wrong-doers. The folly of the conscience-stricken victims, their backwardness or fear of blame, may as well at once be accepted as an expiation of the sin of the despoilers, as become their safeguard against its consequences, if they are neither to be restrained nor yet punished. The aged High Priest and Judge could ill have defended himself against the displeasure he incurred, on any plea that no complaints had been preferred by the sufferers from his sons’ notorious misdeeds.

* Vide page 110.—The Judges had already, it will have been perceived (p. 118, para. 17), previously ordered several cases to be tried as *conspiracy*.

22. The subject of money-coiners having also elicited some observations

Base Money-Coiners.

in connection with the inquiry as to the bhar robbers, I am led, by the remark of the Judges in paragraph 6 of the Registrar's letter, "that nothing would be gained by a law making the coining of money other than the current coin penal, because men would then cheat with false jewellery, as they now do with false coins," to bring to notice, that among bhar robbers it is often a practice to effect the *bhar* or swindle with false money, as with false jewellery; and consequently, that if these people may be proceeded against according to the method I have advocated, the nature of the charge against them for the swindle would not be affected by the *currency* of any coin by which they may have accomplished it,—for how they obtained the false coin, whether they made it or not, would not necessarily be investigated.

23. With reference, however, to proceedings against those people who both coin false money and pass it off, and regarding whose habits I have occasionally had the honour to address Government, I think some measures should be adopted, making it penal *to coin*, whatever the currency, if we would save ourselves from an imputation that such practices are in a manner licensed by ourselves, from a want of some more stringent rules for their repression. I therefore venture to place before Government in the Appendix (marked C) what I brought to the notice of the General Superintendent on this subject in my General Report before alluded to; in illustration of my remarks in which, as to the prevalence of this crime throughout the empire, I may, in conclusion, represent, that while at home, I noticed, in an early number of the *London Times* for November 1856, a paragraph, purporting to be information transmitted to St. Petersburg by a Foreign Minister at the Court of Teheran, to the effect that a large quantity of false foreign money had then recently been conveyed beyond the frontier, coined in India, by the agents, I believe it was stated, of the East India Company! and, moreover, that lately, when I was on service in Persia, a proclamation was issued from Teheran, arising perhaps from some false Persian money having been passed off by some of our camp followers, who were probably coiners, warning all Persian subjects of what they received from us, as that we could well pretend to pay so handsomely for all we obtained from the country, by making the payment in counterfeit monies; of which, the proclamation declared, several specimens from our camp had reached His Majesty the Shah!

I have the honour to be, &c.

(Signed) C. HERVEY, Captain,
Assistant General Superintendent.

Assistant General Superintendent's Office, Belgaum, 22nd September 1857.

APPENDIX.

A.

Extracts Paragraphs 14 and 15, and Paragraphs 42 to 52, from a GENERAL REPORT by Captain HERVEY, Assistant General Superintendent for the Bombay Territories, to the address of the General Superintendent of the Operations for the Suppression of Thuggee and Dacoity, No. 14, dated 22nd January 1856.

Para. 14. The crime of Thuggee by administering deleterious drugs requires, however, to be more certainly noticed. Thuggee by means of Poisons. It has been appropriately called “a species of Thuggee,” being known in the Department as ‘Datura Thuggee,’ in Western India as ‘Mawa’; and as it is often practised under this Presidency, it may not be out of place to make the following quotations from my Reports on the subject:—

“19. I have now to advert to the inquiry into the crime of poisoning for the purposes of robbery. My attention was led to this subject so far back as 1847, when some persons belonging to my own establishment happened, while on their way to Belgaum, to have been drugged and robbed when alighted at Marihall, ten miles from my head quarters. On that occasion I endeavoured in vain to discover the perpetrators, feeling somewhat incensed at such an outrage being practised upon people connected with a Department I thought would be avoided. Though failing then, the matter was not lost sight of; and having had occasion to send one of my approvers to the Dharwar Jail as a punishment, he on his release informed me that he had learnt from a fellow-prisoner the name of the party who had taken part in the above offence. I immediately sent to have him seized, which was done just as he was at the same time required to answer for a similar act of crime he had, joined by two associates, but recently committed at Hindkull, in the Elaka (or province) of the Putwurdhun of Shetbal, and which had terminated

Captain Hervey, Assistant General Superintendent, to the Secretary to the Government of Bombay, Judicial Department, No. 52, dated 26th March 1852, paragraphs 19 to 27.

in the deaths, from the effects of the drug, of two goatherds, and the robbery of their entire flock of 115 goats.

"20. His name was Khadir, a Mussulman, belonging to the said village of Marihall, situated in the Elaka of the Putwurdhun* of Sanglee; and I solicited the Political Agent Southern Muratha Country to permit me to have the custody of him, with the view to my prosecuting an inquiry whether there existed any organised gangs of professional poisoners, such as this man and his associates seemed to belong to, and whom I proposed to proceed against under the provisions of the several Acts for the suppression of Thugs and Thuggee, should I find them to come within the scope of those special laws: Colonel Sleeman, the late General Superintendent of the Department, having remarked, in an old report, that since the large associations of Thugs had been broken up by the proceedings of the Department, he believed the crime still to be occasionally practised by isolated members of the fraternity, who, in want of hands, made use of poisonous drugs, by administering which they contrived to rob their victims while under the effects thereof.

"21. Subjoined is my report on the subject to the Political Agent Southern Muratha Country (viz. to J. D. Inverarity, Esq., No. 211, dated 30th December 1851†), showing, that while the crime certainly existed, there was nothing, with reference to any systematic *combination* for its purposes, as could lead me to include it in the crime of *thuggee*, the suppression whereof appertained to the duties of this Department.

"22. It presents itself, however, from the inquiry, that some precautions ought to be adopted to check this crime, which, if continued to be licensed, as it in a manner would seem to be from the few reports of its occurrence when really occurring, might grow into one of serious magnitude.

"23. With this view, I respectfully beg to submit to Government the returns I had, while in the course of the inquiry, called for from the several local Authorities, of the extent of the crime in their respective jurisdictions during the past two years (1850-51). They exhibit the following reported instances, viz:—

In the Belgaum Collectorate	3
Dharwar ditto	3
Sattara State.....	4
Poona Collectorate	6
Ahmednuggur Collectorate.....	1
Rutnagherry ditto	4
Khandeish ditto	1

* The family name of several of the Chieftains of the Southern Muratha Country.

† This report has been annexed to this Appendix, at page 133.

In the Sholapore Collectorate.....	4
Tanna ditto	20
Sawunt Waree State	None.
Angria's Colaba State	None.
Surat Collectorate.....	4
Jaghceerdar States.....	2
<hr/>	
Total....	52

Attended with the deaths from the poisons of fifteen of the drugged parties, with the punishment of only thirteen of the criminals in twelve of the cases *in which death did not ensue*, and with the robbery of property to the value of Rs. 5,717-0-10, with but the recovery to the extent thereof of Rs. 48-10-11.

“24. The above may not be calculated to excite any particular observation, or alarm, on account of this crime; but I regret to say that I do not think it displays its actual extent.

“25. That it does not do so, may be gathered from the Report I have ventured to refer you to (*viz.* the letter to Mr. Inverarity, No. 211 of 1851), in which it is shown that of the twenty-four instances of the crime elicited during the inquiry as the deed of the man Khadir and his companions, *five only had been known to the Police, or had been reported*; from which I am apprehensive, that probably the above are a few only of the cases that have really taken place in the districts of the Presidency.

“26. I am not, however, disposed to attach any blame on that account to the Police, because I find that, in several of the instances, *females* had been the dupes. They have generally been returning home from the neighbouring market towns, or proceeding on some visit, when met and accosted by the scoundrels; by suffering whom to accompany them, they have been easily persuaded to partake of their ‘sweetmeats,’—and on returning to consciousness only have they become aware of the cheat and robbery. For obvious reasons, they would keep the matter to themselves, for fear of what might not be attributed to them.

“27. The robberies, too, being generally to but a trifling extent, the suffering parties, whether men or women, would abstain from making any formal complaints thereof, in order to avoid the much dreaded liability of being frequently called away from their employments to give evidence on the subject,—a feeling which, it is to be feared, leads much to the prevalence of crime; *and it is only when death has ensued* that a report may be depended on being made.”

“33. The return of poisoning, cases is as favourable, but, for reasons stated in my last Annual Report, should not be taken as a criterion of the real extent of so secret a crime. The total number of reported instances thereof during 1852 amount to twenty-one, followed by the deaths of two of the drugged parties, and with the conviction and punishment of three men in three of the instances *in which death did not ensue*. In 1850-51, the reported cases amounted to fifty-two, attended with the deaths of fifteen persons, and the punishment in like manner of thirteen men.

“34. The several Superintendents of Police cannot, however, be too frequent in their injunctions to their subordinates to seek out and report all occasions of this crime, the great object being to keep it from gaining head, and its members from forming any systematic combination for its purposes, as in the case of thuggee properly so called; for it has been justly observed in your letter to my address under date 19th June 1852, No. 4576, paragraph 3, that ‘the danger of the crime increasing is in proportion to the difficulty of detection’; and I shall be glad if this could be impressed upon all Magistrates, upon whose prompt communications the Department has necessarily to depend.”

Para. 15. It may also be shown, from reported instances of the crime, what Fate of the Victims of Datura Thugs. commonly is the fate of those upon whom it is successfully practised :—

“28. Suffered thus to thrive by the crime, its followers would have little to fear but the chance of administering an overdose, causing death, which it does not appear to be any part of their system to design; and as by their prosperity would more be led to follow their example, it is not difficult to imagine how often murder may be committed, by the use, by ignorant persons, though but for the sake of simple robbery, of drugs obtained from trees and roots in the jungles, the proportions of which must in all cases be but guessed at, according to their estimate of the sense-retaining faculties of those to be made insensible.

“29. Thus, in May 1848, a man and a woman (brother and sister) set out together from their village of Goorgirree, in the Chikoree Talooka,* on a visit to their daughter-in-law at Belgaum, the son of the woman being left at home. While on their return shortly after, they saw by the way a man seated

* A sub-division of a district.

Captain Hervey, Assistant General Superintendent, to the Secretary to the Government, Bombay, Judicial Department, No. 61, dated 6th May 1853, paragraph 33, and part of paragraph 34.

Captain Hervey, Assistant General Superintendent, to the Secretary to the Government of Bombay, Judicial Department, No. 52, dated 26th March 1852, paragraphs 28 to 30.

under a mango tree, his face partly concealed with his 'kumlee' or blanket, who, on being told, in answer to his inquiries, that they were going to Goorgirree, said he would accompany them, as that he too was going to the same place. Resting at a nulla (rivulet) somewhat further on, to refresh themselves a little during the great heat of mid-day, the stranger, on observing that they were about to partake of some parched rice, said he had some sweetmeat that had formed a portion of a 'prussadh' or offering to Arwéuppa (a Hindoo idol), and that he would give them some as a relish to their repast. To partake of such being commonly believed to be productive of benefits, they accepted the seeming kindness, and ate of what he gave them accordingly. On resuming their journey, both soon began to wander about in a state of stupefaction. *Four days after*, the woman recovered her senses, and found that she had been deprived of the few personal ornaments she had about her, her brother not present, and the pack-bullock she had been riding, gone. She hastened, first to the temple close by dedicated to Arwéuppa, and thence to her home, where she told her son of what had occurred, adding, that she did not know what had become of his uncle. He, accompanied by a friend, hurried to the spot above indicated, and searched about for his missing relative. Hard by, up among some hills, they discovered the skull, ribs, and mangled limbs, of a human body, that had been devoured by jackals and dogs. The lad had no doubt they formed the remains of his uncle, though their condition did not admit of his identifying them as positively such. *The sweetmeat had been drugged.* Again, one day in November 1849, two little girls and a boy, all about the same age, were tending some cattle of an aunt in the open country adjacent to Hooblee (Belgaum), and close to a temple to Bussapa (another Hindoo idol). A man, enveloped in a black kumlee, came up to them, and said that his bullock had strayed, and that by distributing among them some sugar he had been offering to the idol, it would serve as a charm in his recovering the lost animal. They partook of it; the two girls but sparingly, 'because it tasted bitter.' The lad ate the whole of his share. The former were found near the temple in a state of insensibility, by a cultivator whose approach had scared away the ruffian, who consequently lost his booty. They recovered on the following day; and the latter, dead and stiff, in a field some little distance off. On another occasion, in the following December, a little girl and two boys, one of the latter blind, were, in the same way, in charge of cattle in some fields near Yedhullee (Dharwar). A man came up to them, and gave them some parched rice and some sweetmeat, saying it was part of a prussadh of the 'deo' (or idol), and that he could not think of partaking of it without giving some to such children. The three were found lying in a neighbouring nulla, the blind boy not so completely lost to

consciousness as his two companions. Antidotes were quickly administered by their affrighted relatives, and they recovered.

“ 30. On each of the above occasions, as in almost every instance, *but only one man was seen* as the real culprit, pretending to be a Hindoo ; but he was, except on the last mentioned occurrence, the man Khadir himself, disguised as a Hindoo, his companions keeping themselves unseen. On the third occasion, again, he was one of those who remained retired.”

“ Ramnac, pensioner of the 3rd Company 5th Battalion Artillery, and residing at Raidgaum, Talooka Chandore, with Beekhee

Extract from the Crime Report from the Assistant Superintendent of Police of Nassick, No. 2 of 1854, dated 14th April 1854.

his wife, came to Nassick to receive his pension, then seven months due, from the Poona Pension Paymaster, and they took up their residence in the house of Kondia wulud Soeria Mahar, resident

of Nassick, and the father-in-law of the prisoner Govinda wulud Yemmia Mahar. On the 20th February, Ramnac received his pension, viz. Rs. 49, for seven months, and bought gold and necessaries with the money. In addition to this, he had other property, which altogether now amounted to Rs. 56-9-4, in gold and ornaments, and Rs. 9 ready money. On the 23rd February, they, (Ramnac and Bheekee), set out for the ‘juthra’ or fair at Trimbuck. At Satpoor, they fell in with Govinda, who accompanied them to Peepulgaum. Here they separated, Govinda going into the village, and they pursuing their journey. At Myrownee, the prisoner again caught them up, and gave them two ‘pairas,’ a native sweetmeat, which they accepted and ate. The pairas were not such as would be purchased from a sweetmeat seller. The same evening they reached Kamballa, and there vomiting and purging took place. They remained there during the night, and the following morning a dooly (or litter) was procured for the woman, and the man rode his pony. No sooner had they reached the tank, than the woman requested to be taken out. They acceded to her request, *and whilst lifting her out she expired.* * * * An inquest was held on the body, and a verdict given that ‘the deceased had died from the effects of poison.’ The deposition of the complainant was at once taken on oath, who related all the above facts. The complainant appeared better, but, not continuing to improve as he should have done, he was despatched to Nassick, *but at Satpoor, on the 26th February, he expired.* After a *post-mortem* examination, the Civil Surgeon, J. M. Knapp, Esq., decided that the man ‘had died from the effects of poison,’ and forwarded the contents of the stomach, which were of a greenish colour, in a bottle to the District Police Officer.

“The Mahar with whom they put up at Kamballa states on oath that both

deceased and his wife said before him to the Rukhwaladar (or watchman) of the village, that the prisoner had given them two pairas, which they ate."

"On the 25th October, the Police Patel* made a report to the Joint Police

Extract from the Crime Report from the Assistant Superintendent of Police of Nassick, No. 3 of 1853, dated 14th December 1853.

Officer, that he had received intimation that, near the tank, some clothes were lying, but no men were to be seen. On this, search was made by the Patel and villagers, when two men were found lying in an adjoining field, intoxicated with some

drug. The Joint Police Officer received this report on the same day, and proceeded at once to the spot. From the evidence of these two men, who had then recovered, it appears that a party of four, consisting of themselves, and Naroo and Luckoo Patel, had set out from Bombay to visit Trimbuck. At Bhewndy, two others, viz. a Purbhoo by caste and a Purdêsee Brahmin, joined their party. At Kassara they all bought some flour and 'dhal' (split vetches), and gave it to the two last mentioned to keep. At Geernaree, Luckoo Patel cooked some of this for their (the four's) dinner. After partaking of it, they were all four taken sick with giddiness and vomiting. 'In this intoxicated state, we made for the tank, and Naroo and Luckoo Patel must have fallen in.' Naroo and Luckoo had in their possession property to the amount of Rs. 106-10-0, in all Rs. 159-4-0. Search was immediately made, *and two lifeless bodies were discovered in the tank, and recognised to be those of Naroo and Luckoo Patel.* No property whatever was found on the parties, but their clothes."

"With reference to Police printed Circular No. 31, and accompaniment

Captain Rose, Officiating Superintendent of Police of Khandeish, to Captain Hervey, Assistant General Superintendent, No. 35, dated 25th June 1855.

thereto, I have the honour to inform you that a case of poisoning, or rather drugging, took place at the 'dhumrumsala'† of the village of Jhorga, on the Agra high road, in the Malligaum Talooka, on the 7th instant.

"Three travellers, Mahomedshah wulud Oomershah, of Islamabad, in Cashmere; Shaik Khoodabuksh wulud Panga, of Deenanuggur (Punjaub); and Gooroo Balladas bin Gooroo Kunnaldas, a Rajpoot, converted and become a Fakeer, were on the above date at Jhorga, consulting about preparing a meal, when they were joined by a Mussulman, who gave his name to be Shaik Hussun Ali, of Indore, who offered them a cake to eat, and appease their hunger with before commencing to cook. They divided the cake among them, and ate it.

"A Police Sepoy came when it was becoming dusk in the evening, and warned them against accepting food from any stranger.

* Village Headman. There are generally two Patels in each village, one having magisterial and the other revenue jurisdiction; and these offices are usually hereditary.—C.H.

† Alms-house or place of shelter for wayfarers, erected by charitable people.

"They at that time felt drowsy, but they ate their dinner, and afterwards became insensible, not, however, before the stranger Mussulman had again come and sat down near them; and on their attempting to catch him he gave them a lash with something like a leather whip, and ran away. They lost nothing but an umbrella, a leather water-bucket and string, a cloth cap, two rings, eight emeralds, and a bag, altogether worth Rs. 12-7-0; the Rs. 46 they had in cash remained safe.

"The guilty party has escaped detection as yet.

"Since the above occurrence, three other offences of a somewhat similar nature have taken place in this Zilla, two in the Dhoolia, and one in the Amulnair Talooka.

"In each case the culprit or culprits, *though it seems the work of one person*, have exercised their craft upon children, who, on some plausible plea, were inveigled into the jungle and deprived of their ornaments.

"If one of your detectives, acquainted with Khandeish, were deputed here, he might succeed in discovering the authors of the above offences, and stop the further spread of this rather unusual species of crime."

"In accordance with Police printed Circular No. 31, of the 15th June 1853,

Captain Rose, Officiating Superintendent of Police of Khandeish, to Captain Hervey, Assistant General Superintendent, No. 92, dated 18th December 1855.

I have the honour to bring to your notice that on the 2nd instant, at the village of Pallasnair, near the Sindwa Ghaut, in the Thalnair Talooka, two Brahmin travellers arrived.

"One of them mixed some narcotic in the other's food, which rendered him insensible, and temporarily deranged; an opportunity which the poisoner took to disappear with all his victim's goods, consisting of cash, clothes, pots and pans, &c. to the value of Rs. 66-4-0.

"A 'lota'* of the delinquent's was discovered, and was sent to the Mamlutdar of Thalnair.

"It was discovered that the Thug had taken the route towards Dhoolia, and pursuit was made.

"The injured party gives his name Dr. Sambh Wydh, and says he has of late been residing at Indore. His unprincipled companion joined him at the Nerbudda, and said his name was Wassoodeo Punt, which is all the unfortunate physician Sambh knows about him."

Para. 42. In declaring, however, that organised crime has diminished within the range over which my operations extend, it is incumbent that I should make some reservation with respect to any decrease of the crime of "thuggee by means of poisons," already before noticed.

Datura Thuggee reconsidered, with reference to the Decrease of Crime.

* Brass or copper water-pot.

Para. 43. I have shown, from the extracts quoted on the subject of this crime under the 14th paragraph of this Report* (to the Bombay Government, No. 52, dated 26th March 1852), that if reports of its occurrence continued to be withheld, as there was reason to apprehend they were, it might grow into one of serious magnitude; that death might continue to be dealt without design, arising but from the ignorance, on the part of the persons practising the offence, of the deadly effects of the drugs on some at least of the people to whom they may administer the same; and that a system of robbery, thus often combined with murder, might continue to be perpetrated in these districts, without any serious efforts for its suppression, when any report thereof was generally only to be looked for *on death actually ensuing*.

Para. 44. I have further shown, from the extracts (given under the same paragraph) from my Report No. 61, dated 6th May 1853, the notice taken by the Government of Bombay of what I had ventured to place before them as above†; by whom it was further observed, in reply to that report (Secretary to Government, Judicial Department, to Captain Hervey, Assistant General Superintendent, No. 1263, dated 15th June 1853), that the Superintendents of Police would be directed to watch for the appearance of the crime, and to report it directly they heard of it, "the great object being, as you justly observe, to prevent its members from organising themselves systematically."

Para. 45. In my Annual Report to the Bombay Government for the year 1853 (to the Secretary to Government, Judicial Department, No. 64, dated 2nd May 1854, paragraph 17 and part of 18), I stated,—

"17. The crime of robbery by administering deleterious drugs (*i. e.* 'mawa' or 'datura' thuggee) continues to be practised here and there in the territories subordinate to the Bombay Presidency; even occasionally at Bombay itself,—a case having, I perceive, been tried during the recent Sessions of the Supreme Court of Judicature; but, I am happy to think, not to any great extent. I have still, however, to say, that the infrequency of the crime is not to be resolved from the small number of reported instances thereof. But twenty cases have been reported to have taken place throughout my range during 1853, attended with the deaths from the effects of the poisons of five persons, viz. one man in the Akulkote Elaka, and four men in the Nassick Sub-Collectorate. Of nineteen apprehended parties, one man was punished by the local Magistrate, twelve were released, and six committed to Sessions Courts, the result of whose trials has not been communicated.

* Vide page 122.

† Vide paragraph 34, page 125.

"18. The crime is committed by both Mussulmans and Hindoos,—generally, I believe, in isolated gangs, unconnected with each other."

Para. 46. Government replied to this, in Resolution dated 6th March 1855, No. 1066, paragraph 7, that "the system of robbery by administering drugs, called 'mawa' or 'datura thuggee' was one of the heinous classes of crimes against which the law provided, and could be repressed only by the severe punishment of those convicted of practising it."

Para. 47. Whether I have or have not succeeded in creating any impression as to the serious nature of the crime under advertence, whether I have given sufficient reasons, from my various notices thereof, for saying that it is a crime that is practised, from which death does ensue, and that

Inadequacy of the Ordinary Law for the Suppression of Datura Thuggee considered. punishment does *not* follow commensurate with the offence,—I must leave to superior judgment to decide; but, impressed as I am, I submit most respectfully, with a sense of my bounden duty on a subject so intimately connected with the welfare of a large bulk of unoffending people, who, in their minds secure from harm under the protection of the Government they rejoice they live under, fear not to go whither they list; but of whom at any rate *some do*, even in the enjoyment of such fancied security, fall victims to wretches who, equally secure, from immunity afforded by the very laws that, intended for their punishment, they by experience know neither prevent them nor protect the others, watch for the unwary to spoil or to murder them,—I cannot refrain from taking advantage of the opportunity offered, in a report of this kind, to bring prominently to notice the prevalence of this dangerous crime, and to the *inadequacy* of the existing laws for its prevention.

Para. 48. Sure that my motives cannot be misunderstood, I submit, for

1. Captain Hervey, Assistant General Superintendent, to Mr. Secretary Erskine, No. 56, dated 24th April 1854.

2. Mr. Secretary Anderson to Captain Hervey, Assistant General Superintendent, No. 3657, dated 2nd August 1854.

3. The Registrar of the Sudder Foujdaree Adawlut to Mr. Secretary Anderson, No. 1633, dated 4th July 1854.

4. Government Memorandum in the Judicial Department, to Captain Hervey, Assistant General Superintendent, No. 2769, dated 25th June 1855.

5. Captain Hervey, Assistant General Superintendent, to Mr. Secretary Anderson, No. 124, dated 2nd July 1855.

such notice as you think proper, the correspondence (named in the margin, and copies of which appear in the Appendix),* with an earnest but respectful hope that the subject may engage your attention; particularly whether, as the provisions of Act XXIX. of 1850 were so admirably devised to check the crime when perpetrated within the jurisdiction of Her Majesty's Courts of Justice in India, in the equal absence

* At pages 136 to 141.

6. Resolution of the Bombay Government in the Judicial Department, No. 3289, dated 28th July 1855.

7. Ditto ditto, No. 3732, dated 24th August 1855.

Reasons why Act XXIX. of 1850, for the punishment of poisoners, might be declared a General Act.

recommended to be extended with similar benefit to other parts of India: appearing, as it does in my humble opinion, that a crime not met by any stringent measures in so considerable a portion of the empire must, as a matter of course, be far more frequently committed in it than in the spots that, forming but a limited portion of the whole of India, inhabited too, as they in fact are, and frequented by people who but represent the great body of the population of that vast peninsula, can bear no proportion to it at all.

Para. 49. To be more perfectly understood, I submit, that if it was necessary to enact a law (XXIX. of 1850) for the better

Act XXIX. of 1850 as a General Act advocated.

prevention, within the jurisdiction of Her Majesty's Courts of Judicature, of a crime considered to

require some rigorous decree for its readier suppression, but found, however, to need the same, from the actual occurrence of the crime (detected, as it probably was, because in such comparatively confined localities as comprise the judicial limits of the Supreme Courts it was not, with the efficient Police belonging to those places, difficult to discover the perpetrators), it is but reasonable to infer that, in a much wider range of territory, in which the Police are neither so efficient, nor, with reference to their distribution, so numerous, and in which the same crime *does prevail* (to what greater extent it is not hard to be conjectured, even from no better premises than I have been able to submit), it is at least quite as necessary that the same law should obtain for the prevention of the same heinous crime?

Para. 50. In urging such a measure, I can only look forward to the effects

The good results to be expected from Act XXIX. of 1850 being made a general one.

of it. Let the same law be introduced into the Mofussil as is in force within the towns of Calcutta, Madras, and Bombay, the special jurisdictions of Her Majesty's Justices; let its territorial scope

be *general*, as the Index to the Acts for the year 1850, by some felicitous misapprehension, declares Act XXIX. to be; let justice be dealt accordingly to the class of offenders its provisions are intended to reach,—and the crime of robbery by administering poisons would be more seldom heard of.

Para. 51. The Government of Bombay have stated that it is “a heinous

The immunity afforded to Datura Thugs when tried under the Ordinary Law.

crime, and can be repressed only by the severe punishment of those detected in practising it”;

yet that it is “of a class for which the law provides”: but, as already above shown, it is practised in such a way *that but one person is seen*, namely the man by whom the drugged sweetmeat is administered;—he is seen, to be noticed, only by the persons who, by partaking of what they believe is kindly offered, very soon after fall into a state of insensibility. In that state they are robbed by him and his *unseen* associates; and if they do not die, they recover on but the second or third day; they have but an indistinct recollection of the stranger by whom they were accosted, and from whom they received the fatal meal. Their evidence must be of the most unsatisfactory description. The precautions on the part of the culprits save them from being discovered in the possession of any portion of the property plundered by them. Acquittal necessarily ensues; or, if any conviction is gained, the punishment under the ordinary law is immaterial,—certainly not sufficient to deter others from following the same malpractices, or the convicted parties either from again reverting to them on their eventual liberation. *Severe punishment is not attained.*

Para. 52. Let the offence, however, be regarded as a growing evil, or at all events *an existing one*, and let the law be introduced

Under the operation of Act XXIX. of 1850, as a General Law, Datura Thuggee may be suppressed by the Thuggee Department.

I have ventured to suggest, ensuring the severe punishment evoked by the Government of Bombay,—death or transportation for life. The crime would then, with the aid of the testimony of

accomplices (the only evidence by which, as in the other organised transgressions recognised by this Department, the deed can be fixed upon the delinquents), very soon be circumscribed and put down, *and the Department* be enabled to effect this under a system of convicted approvers and the operation of the rules by which it is guided: for I believe it to be generally acknowledged, *that it is competent only to this Department to suppress it effectually.*

(True extracts)

(Signed) C. HERVEY, Captain,
Assistant General Superintendent.

No. 211 of 1851.

THUGGEE AND DACOITY DEPARTMENT.

From Captain C. HERVEY,

Assistant General Superintendent,

To J. D. INVERARITY, Esq.,

Political Agent Southern Muratha Country, Belgaum.

Dated Belgaum, 30th December 1851.

SIR,—With reference to my Muratha yadi (or memorandum) to the address

of your predecessor, No. 214, dated 12th July last, requesting the custody of a man named Khadir, residing at Marihall, in the Elaka of the Putwurdhun of Sanglee, and to Mr. Reeves' endorsement dated 12th idem, complying with the request, and desiring that the man might be returned when no longer required, with the view to proceedings against him in a case of poisoning and robbery at Hindkull, in the Elaka of the Putwurdhun of Shetbal, I have the honour to submit, herewith, the proceedings of my inquiry into the supposed existence in the Southern Muratha Country of bodies of professional poisoners, among whom the man Khadir was believed to be a principal man.

2. My object for this inquiry was, to ascertain whether any secret associations existed, here or elsewhere, for the purpose of robbery by means of poisons, as could be stated to form any such general and systematic combination as 'thuggee' in its unrepressed times, owing to which it might be necessary to carry on the same operations for its suppression as peculiarly the duty of this Department; for, from various reports, I had reason to believe that the crime of robbery, by producing stupefaction, was a very common one in many of the districts under this Presidency; and it became me to inquire whether the same could be comprehended within that of 'thuggee.'

3. I am now able to state that it has not been elicited from these proceedings that there is any such general confederacy of this class of criminals as could warrant me to proceed against them as professional Thugs, with any prospect of the evidence of approvers being as sufficient for their conviction as the comprehensive nature of thuggee and dacoity admits of in the various Courts of law; and that, consequently, upon the present information only, it would be as yet premature for this Department to take any further measures against them.

4. You will perceive, however, from my proceedings, which, according to the course obtaining in the Department, consist of a record or file of every document that has passed during the inquiry, and the whole of which, for your readier reference and perusal, I have transcribed into English, that the number of elicited cases of robbery by means of poison has been twenty-three within the past five years, in which the man Khadir was a principal, and, according to his account, nineteen others his accomplices; and that an additional case has been deposed to (the drugging and robbery at Nasurgee of Bheema Korwee), the perpetrators of which remain unknown.

5. The above twenty-four cases have occurred as follow, viz:—

15 in the Belgaum Zilla.

2 in the Dharwar Zilla.

1 in the Canara Zilla.

6 in the Putwurdhun States.

6. One of the cases in the Dharwar Zilla was attended with the death, from the effects of the drug, of one person ; and two in the Putwurdhun States, with the deaths, from the same cause, of three persons.

7. Of the twenty-four cases, one only of the fifteen in the Belgaum Zilla, two in the Dharwar Zilla, and two in the Putwurdhun States, were reported by the Police Authorities, or were even known to them ; the rest only became elicited during the present inquiry, of which last, six in the Belgaum Zilla and two in the Putwurdhun Elaka, have been verified in this Office by the poisoned parties, the rest remaining as yet unauthenticated.

8. Thus, of the total number of twenty-four cases, five only were known to the Police—that is, were reported by them ; and thirteen, including the above five, have been established.

9. The number of persons engaged in these acts of crime—excluding for the single case above alluded to, the guilty parties in which are unknown—amounts to twenty men, of whom eleven are residents of the Belgaum Zilla, one of the Kolapore State, two of the Koorundwar Elaka, and six of that of the Putwurdhun of Sanglee ; the head quarters of the latter, which include the principal or leading members of the whole, being at Marihall, ten miles from Belgaum, where all the expeditions resulting in the above acts would seem to have been planned.

10. Of the above twenty persons, the following would, according to the statements of Khadir, be the extent of the implication of each :—

1 (Khadir) concerned in	23	affairs.
1 (Lingya Bedur) in	4	do.
1 (Mootgiah Bedur) in	11	do.
3 in	2	do. each.
14, including Lugmunna and Raya, in....	1	do. each.

11. Of these, three are Mussulmans, eleven are Bedurs, four are Kolies, one a Muratha, and one a Dhêr. They are unconnected with each other by any ties, or by even any conventional obligations towards each other, so binding among other, the more maturely formed, classes of professional criminals ; and they all, except one man (Mootgiah), reside at fixed places.

12. The above data have been gathered chiefly from the statements of Khadir and Lingya, two confessing parties ; and, besides their own, there is no evidence whatever against any of the others, except direct in one instance, against the man Mootgiah Bedur, and presumptive against Lugmunna and Raya.

13. It is evident, therefore, from the above premises, that, though from the circumstantial, however qualified, statements of the two confessing parties, it

might not be doubted that complicity on the part of the others existed, any case committed upon the evidence only of those two men, would not sustain conviction in any of the ordinary Courts of Justice, the crimes having been secretly executed, and generally *only the man who administered the stupefying drug* having been perceived by the victims.

14. From my proceedings, you will perceive, however, that five men have been taken into custody during this inquiry, of whom one is a resident of the Company's territory, the rest being inhabitants of the Sanglee Elaka; and as the crime, therefore, at Hindkull, for which Khadir was about to be tried by your predecessor, as alluded to in the 1st paragraph of this letter, and which resulted in the deaths of the two poisoned parties, and in the robbery of a flock of 115 goats, implicates two of the others, including the man Raya, and as the others reside also within your jurisdiction, I now do myself the honour to transfer them to your custody, for such further measures as you may consider necessary: and I would beg here to solicit your favourable view of the claim I consider the man Khadir has, as adverted to in my finding, to being exempted from the punishment of death; it having evidently been his object, though without any assurances from myself, to make the disclosures now elicited, upon the hope of perhaps being able to save himself by so doing; and I may be permitted to record my appeal in his behalf accordingly.

I have the honour to be, &c.

(Signed) C. HERVEY, Captain,
Assistant General Superintendent.

Assistant General Superintendent's Office, Belgaum, 30th December 1851.

B.

No. 56 OF 1854.

THUGGEE AND DACOITY DEPARTMENT.

To C. J. ERSKINE, Esq.,

Secretary to Government, Judicial Department, Bombay.

SIR,—As I have, in the proposed Act for the better prevention of Thuggee, &c. in the territories comprehended under the Bombay Presidency, submitted with my letter to your address No. 54, dated 22nd instant,* suggested, that its provisions should extend to Act XXIX. of 1850, and as by Clause III. of the

* Vide *post* at pages 141 and 144.

latter, it is declared, that it shall be construed with and as part of Act XXXI. of 1838; and as a doubt may exist whether, under the operation of Clause II. of the latter Act, the provisions of Act XXIX. of 1850 can be intended to extend to any other persons than those comprehended within the jurisdiction of Her Majesty's Courts of Justice, I have the honour to request that the question may be referred to the Legal Remembrancer of Government, viz. whether, as Act XXIX. of 1850 is entitled an Act "for the prevention of poisoning," it may not be construed, although declared to be an amendment of Act XXXI. of 1838, to apply to the crime of poisoning *throughout* the territories of the Honorable East India Company, whatever the jurisdiction?

2. For the Act (XXIX. of 1850) meets so completely the crime of robbery and murder by administering deleterious drugs on the part of persons associated together for its purposes (in the Department called Datura Thugs), that, with reference to the prevalence of that crime within the Bombay Presidency, it would very much facilitate the operations of this Agency against that class of criminals if the said Act could be declared to extend to the crime of Thuggee, as interpreted by Act III. of 1848.

I have the honour to be, &c.

(Signed) C. HERVEY, Captain,
Assistant General Superintendent.

Assistant General Superintendent's Office, Belgaum, 24th April 1854.

No. 3657 OF 1854.

JUDICIAL DEPARTMENT.

To Captain C. HERVEY,
Assistant General Superintendent.

SIR,—With reference to your letter dated the 24th April last, No. 56, I am directed to transmit, for your information, copy of a letter from the Registrar of the Sudder Foujdaree Adawlut, dated the 4th ultimo, No. 1633, and to inform you that His Lordship in Council entirely concurs in the opinion of the Judges of the Sudder Adawlut therein expressed.

I have the honour to be, &c.

(Signed) H. L. ANDERSON,
Secretary to Government.

Bombay Castle, 2nd August 1854.

No. 1633 OF 1854.

TO H. L. ANDERSON, Esq.,

Secretary to Government, Judicial Department.

SIR,—I have the honour, by direction of the Sudder Foujdaree Adawlut, to acknowledge your letter of the 22nd ultimo, No. 3146, forwarding, for the opinion of the Court, copy of a letter from the Assistant General Superintendent of the Operations for the Suppression of Thuggee and Dacoity in the Southern Muratha Country, and requesting to be informed whether the Judges consider that Acts XXXI. of 1838 and XXIX. of 1850, should be declared general Acts for the whole of India.

In reply, I am desired to state, for the information of the Right Honorable the Governor in Council, that the Judges are not aware that any necessity exists for extending the Acts in question to the whole of India. No case has yet been brought to the notice of the Court which would have been punished by those Acts, and was not adequately punished by the Acts and Regulations in force; and until cases of that kind arise, the Judges would not advocate the introduction of so radical a change in the penal laws, as the introduction into India, generally, of this Act, intended to be administered only by Her Majesty's Supreme Court, would be.

I have the honour to be, &c.

(Signed) M. A. COXON,
Registrar.

Bombay, Sudder Foujdaree Adawlut, 4th July 1854.

(True copy)

(Signed) H. L. ANDERSON,
Secretary to Government.

No. 2769 OF 1855.

JUDICIAL DEPARTMENT.

MEMORANDUM.

In a letter dated the 22nd April 1854, No. 53, to the address of the Assistant Superintendent of Police at Nassick, Captain Hervey, Assistant General Superintendent of the Operations for the Suppression of Thuggee and Dacoity, requested that the prisoner Govinda wulud Yemmia Mhar,

charged with murder, might not be released in the event of his acquittal after trial, but might be made over to the Thuggee and Dacoity Department.

Captain Hervey is now requested to inform Government whether he still requires Govinda wulud Yemmia, as it appears from a letter from the Assistant Magistrate in charge Nassick, that, by some misapprehension of orders, the man was not sent to the Thuggee Department, but was released on acquittal.

(Signed) H. L. ANDERSON,
Secretary to Government.

Bombay Castle, 25th June 1855.

No. 124 of 1855.

THUGGEE AND DACOITY DEPARTMENT.

To H. L. ANDERSON, Esq.,
Secretary to Government, Judicial Department, Bombay.

SIR,—In reply to the inquiry contained in your memorandum under date 25th ultimo, No. 2769, whether, with reference to my letter to the address of the Assistant Superintendent of Police at Nassick, No. 53, dated 22nd April last, the man Govinda wulud Yemmia Mhar was still required by this Department, I have the honour to state that, under my great anxiety to extend the operations of this Agency to the suppression of the crime of robbery by administering poisons (mawa or datura thuggee), it was my wish to obtain the custody of the individual referred to, as I expected that, by an inquiry into his case, some further information might be elicited respecting the persons in the habit of practising it.

2. The decision, however, of Government in the case of the first man I had ventured to send up for trial charged with that crime, whose services as an approver I believed I had secured, presented, it is my respectful opinion, so great an obstacle to further proceedings against that class of wrong-doers on the part of this Agency, that it would now be scarcely necessary to have the man Govinda re-arrested.

Government Resolution in the Judicial Department, No. 3568, under date 13th July 1854, in the case (No. IX. of 1854) of Davee Sing *alias* Keseodass, tried by the Political Agent Southern Muratha Country.

3. The sentiments of Government, as expressed in paragraph 5 of their Resolution in the case already quoted, that the crime under reference "might be tried under the ordinary laws," having been reiterated in paragraph 7 of their Resolution under date 6th March last, on my Annual Report for 1853, as communicated to the Officer lately officiating for me (letter No. 1066, dated

10th March 1855), to the effect that the system of robbery by administering deleterious drugs "was one of the heinous classes of crime against which the law provided," I may not presume to urge anything in contravention of the same; but as Government have also recorded, in the same resolution, that "the crime could be repressed only by the severe punishment of those convicted of practising it," it might, in the estimation of Government, be useful, in any further deliberations upon so important a subject, to consider how often the ordinary laws have sufficed for the sufficient punishment, or even for the conviction, of the parties charged with robbing people by means of drugs, attended, as the crime has so often been, by the deaths of the parties to whom the drugs have been administered; since, in the very instance of the man Govinda, it would appear, that although shown that it was by him that the drugged sweetmeat (mawa) was given to the two persons who, by partaking of it, were deprived of life, yet that he was acquitted and set at liberty.

I have the honour to be, &c.

(Signed) C. HERVEY, Captain,
Assistant General Superintendent.

Assistant General Superintendent's Office, Belgaum, 2nd July 1855.

No. 3289 of 1855.

JUDICIAL DEPARTMENT.

To the ASSISTANT GENERAL SUPERINTENDENT of the

Operations for the Suppression of Dacoity, Belgaum.

COPY OF THE RESOLUTION PASSED BY GOVERNMENT
on a Letter from the Assistant General Superintendent of the Operations for the Suppression of Thuggee and Dacoity, dated the 2nd July 1855, No. 124, stating that it would now be scarcely necessary to have the man Govinda wulud Yemmia Mhar re-arrested.

That Government adheres to its opinion that a crime, the punishment of which has been provided for by the law, must be dealt with according to law, and not by any extraordinary procedure, which should only be resorted to in extreme cases. The Judges of the Sudder Foujdaree Adawlut may be asked whether, in their opinion, the law as it stands is at all defective, or inoperative, with relation to the crime of poisoning for purposes of robbery or murder, and a copy of this letter be sent to them.

The Joint Magistrate of Nassick has been informed that Govinda wulud Yemmia Mhar is not required by the Thuggee Department.

(Signed) H. L. ANDERSON,
Secretary to Government.

Bombay Castle, 28th July 1855.

*
No. 3732 OF 1855.

JUDICIAL DEPARTMENT.

To Captain C. HERVEY,
Assistant General Superintendent.

Bombay Castle, 24th August 1855.

SIR,—With reference to your letter No. 124, dated the 2nd ultimo, and to the Government Resolution No. 3289, dated the 28th idem, I am desired to intimate to you that the Right Honorable the Governor in Council considers a change in the law on the subject of poisoning is not necessary.

I have the honour to be, &c.

(Signed) H. L. ANDERSON,
Secretary to Government.

(True copies)

(Signed) C. HERVEY, Captain,
Assistant General Superintendent.

No. 54 OF 1854.

THUGGEE AND DACOITY DEPARTMENT.

From Captain C. HERVEY,
Assistant General Superintendent,

To C. J. ERSKINE, Esq.,
Secretary to Government, Judicial Department, Bombay.

Dated Belgaum, 22nd April 1854.

SIR,—The publication for general information, in the *Government Gazette* of the 6th instant, of the Draft of a proposed Act read in the Legislative Council for the first time on the 10th March 1854, to repeal Clause 2, Section

XXXV. Regulation XII. of 1827 of the Bombay Code, leads me to address Government on the subject thereof, as to whether the provisions of such an Act will meet sufficiently the requirements of this Department.

2. The clause proposed to be repealed is, that "the evidence of an accomplice shall operate against a prisoner only so far as it corroborates that of other witnesses, or strengthens impressions produced by circumstances"; the new Act providing that "the degree of credit to be given to the evidence of an accomplice ought in every case to be left to the determination of the Court or Officer whose duty it is to decide the case."

3. I would respectfully submit, that the above terms being general, and not positively definitive, there would not, it appears to me, be any guarantee secured to this Department, that the evidence of its approvers shall in each case have the same credit given to it by the superior or Appellate Court, as may have been accorded by the Court or Officer by whom the case may have been decided.

4. However sufficient for general purposes, and facilitating very much the prosecution of ordinary cases of crime committed for trial by local Magistrates, there would, from the multiplicity of instances tried under the proposed Act, arise so many interpretations of its provisions, that, inasmuch as our operations are concerned, there must follow at no distant period, I venture to state, from the difficulties I have hitherto met with, an application of the same to the cases sent up by this Department, for the presumed better working of which only the new law was, I believe, particularly intended; and thus may eventually ensue all those technical objections and difficulties that have hitherto so much impeded the efficiency of this Agency in the performance of its special duties, to contravene which difficulties it was, that, as communicated in paragraph 10 of the Deputy Secretary's letter to my address No. 1203, under date 15th June 1853, "an application was made to the Government of India to render the evidence of approvers admissible as evidence in Sessions Courts."

5. In my letter to which the above was a reply (No. 61, dated 6th May 1853), I recapitulated (paragraphs 27 to 30) the various decisions of the Court of Sudder Foujdaree Adawlut in annulling the convictions of the Dharwar Sessions Court in the cases of the Dacoits that had been sent up for trial from this Office.

6. In one of those decisions, it was declared by the Superior Court (in the case of Elloo, son of Hybuttee, who had been sentenced to transportation for life), "that though impressions produced by circumstances strengthened the evidence of an approver, and such evidence would sustain a conviction, yet the circumstances themselves must be in evidence connecting the alleged criminal with the crime charged; and as the circumstances were in the

writing of the approvers' narratives, these could not, under the law of evidence, be received"; and I would submit for consideration whether, by the enactment of the proposed law, any security would become established against any similar course of argument being advanced in future decisions?

7. For the vitality of the Department is essentially circumscribed by the validity or force of such a line of reasoning, if valid, and not to be controverted; approvers' narratives forming the staff and strength of its constitution and system.

8. In my subsequent letters, as noted in the margin, to the address of Mr. Secretary Lumsden, I reported that the Judges of the Sudder Foujdaree Adawlut had, without any reference, I believe, as I stated, to the provisions of Act XIX. of 1837, which declared a convicted criminal to be a competent witness at any stage of a trial, in like manner annulled the convictions and sentences in the cases of thirty-two other Dacoits, who had also been one and all convicted by the Session Judge of Dharwar, on the charges upon which they had been committed to his Court by me; and I would be permitted to adduce as a point in support of what I have commenced with saying,—viz. that the view taken by the lower Court in accepting the evidence of an accomplice or approver, even under the operation of the new Act, may not be the same as that which may finally be adopted by the Superior Court in deciding upon a case,—that the Judge by whom the above convictions were arrived at formed a member of the Court by which the same were eventually annulled.

9. The above parties have, as well as others previously similarly acquitted by the Sudder Foujdaree Adawlut, since been tried again upon fresh charges, and have been now a second time convicted in the Court of the Political Agent Southern Muratha Country; and it is to obviate any future necessity for such new trials, attended with much expense to Government, and with serious obstructions to the good and efficient working of this Department, that I most respectfully would urge upon the consideration of Government, that any new law should, in as many words, comprehend and declare what by it may be particularly intended to be conveyed and provided for,—by which, once for all, to disarm every objection that might otherwise be raised, on technical grounds, to the measures the Supreme Government has in its wisdom considered proper to adopt for the suppression of such extraordinary criminals as Thugs, Dacoits, Poisoners, and professional Cheats and Robbers, whose efforts have ever been *to render null the evidence that would be sufficient for their conviction in the Courts of law according to ordinary procedure*; and by whose unchecked prosperity as wrong-doers the peaceable subjects of Government have everywhere in India been ever great sufferers in life as well as in property.

10. I have therefore the honour to submit to the notice of Government, for transmission to the Government of India in its future deliberations on the subject under review, the annexed draft of the amendment I would respectfully propose for adoption, as the Officer most concerned in the operation, under the Bombay Presidency, of any new enactment having reference to the future better efficiency of the means at my disposal for the performance of the duties upon which I am especially employed within its territories.

I have the honour to be, &c.

(Signed) C. HERVEY, Captain,
Assistant General Superintendent.

Assistant General Superintendent's Office, Belgaum, 22nd April 1854.

DRAFT OF AN ACT for the better Prevention of the Crimes of Thuggee, Dacoity, &c. in the Territories comprehended under the Bombay Presidency.

Whereas, the degree of credit to be given to the evidence of an accomplice ought in every case to be left to the determination of the Court or Officer whose duty it is to decide the case; it is enacted as follows:—

Clause 2, Section XXXV. Regulation XII. of 1827, of the Bombay Code, is hereby repealed.

And whereas, it is necessary to facilitate the suppression of the crimes comprehended and pointed at in Acts XXX. of 1836, XVIII. of 1837, XVIII. of 1839, XXIV. of 1843, III. of 1848, XI. of 1848, and XXIX. of 1850; as well as to extend the provisions of Act XIX. of 1837: it is hereby further enacted, that the evidence of two or more approvers, being Thugs, or Dacoits, or robbers, belonging to any wandering gang of persons associated for the purposes of theft or robbery, or poisoning Thugs, or persons who administer deleterious drugs for the purpose of perpetrating robbery, shall be considered to be evidence sufficient for the purposes of conviction, on the Court or Officer whose duty it is to decide the case being satisfied that there has not been any collusion among the said approvers.

(Signed) C. HERVEY, Captain,
Assistant General Superintendent.

C.

EXTRACT Paragraphs 18, 19, and 20 from a GENERAL REPORT from CAPTAIN C. HERVEY, Assistant General Superintendent, to the address of the General Superintendent of the Operations for the Suppression of Thuggee and Dacoity, No. 14, dated 22nd January 1856.

18. The crime of coining and uttering base monies I have frequently had the honour to submit to your notice in the several reports to the Government of Bombay* forwarded by me for your information. It continues to be very extensively practised throughout the territories under this Presidency, particularly by a class of people described in those reports and styled 'Chapah Bunds,' travelling about in the garb of religious mendicants, who conceal the false coins in a very ingeniously contrived pocket, their possession of which has led to the detection of several of these criminals. They are located principally in the valley of the river Krishna, round about Chimulgee, a town in the territory of the Shetbal Raja, and in the Mungolee and Moodebehal Talookas of the Sholapore Col-
 Base Money Coiners.
 Locale of Base Money Coiners in the Bombay Presidency.

lectorate. Some of them have exhibited before me their method of coining spurious money, and how they contrive to pass it off without detection; but they are often detected; and, as the nature of their vocation is well known among their neighbours, when absent upon their periodical expeditions, and as, moreover, the punishments awarded them have, under the law under which the crime is recognised, been ever small, they have seldom, when brought before me, held back their confessions, which have from time to time been furnished by me to the Bombay Government.

19. These false money coiners, known to us as 'Khootsoorrias,' or 'Kullubsazees,' exist, I believe, throughout India; and although in various districts they may vary in castes, their mode of coining is, on the whole, essentially the same everywhere. The suppression of them does not, however, appertain to our Department.

20. While on the duty of the Department lately in the Punjaub, I found the crime to prevail so much there, that I was quite astonished to see the mutilated condition of
 Their existence throughout India.
 Their existence in the Punjaub.

* Vide Vol. II. of Selections from the Records of Government in the Police Branch of the Judicial Department; the compilation in which has, however, been printed in an incomplete form.—C. H.

the Honorable Company's Rupees current in that country, from the tests to which every piece of money had been put by the wary : and so clever are the men, mostly Hindoos, who practise this crime in that province, that they contrive to pass off, with remarkable success, representations even of Bactrian and other ancient coins found in those regions, to even, as I have been informed, the cleverest of numismatists.

(True extract)

(Signed) C. HERVEY, Captain,
Assistant General Superintendent.

PAPERS ON THE SUBJECT OF CONFESSIONS.

No. 178 OF 1851.

DACOITY DEPARTMENT.

From Captain C. HERVEY,
Assistant General Superintendent,

To W. DOWDESWELL, Esq.,
Session Judge, Masulipatam.

Dated Belgaum, 13th November 1851.

SIR,—I have the honour, with reference to your letter No. 606, dated 18th September last, to forward herewith translated extracts from the narratives of the Bhat or Sansiah Dacoits named Kunkia Naik, Himtya, Bhunsee, Bhow, and Grassia Naik, relating to several occasions of attacks upon treasuries and other charges under guards of sepoy of the line.*

2. It happens that not any of the parties named in your letter are with me; but their statements on the points you inquire about have been called for, and will be submitted when furnished. In the mean time, the present documents will serve to show you that it is unusual for these Dacoits, and indeed for any other classes of professional robbers pursuing any particular system, as each tribe of the fraternity does, to permit themselves to be assisted by any one not of their body,—it would manifestly destroy the secrecy of their enterprises to do so; and I have not a single instance before me of the numerous gang robberies I have in the course of my duties investigated, when the deed of professional Dacoits, in which any foreign aid has been sought for, or even required.†

* These extracts may be seen at pages 71 to 79 of Vol. I. of Selections from the Records of the Government of Bombay in the Police Branch of the Judicial Department.

† May 1858.—I must exclude the instance of a well known dacoity committed at Butgeeralh (Dharwar) in 1851 (vide Dacoity No. 39, page 89), in which the dacoits were assisted by some Shetsundees and other village parties; also a robbery at Sirshyal (Sholapore) in 1841 (vide Dacoity No. 33, described at page 86), which was induced by the Police Patel of that place;

3. On all occasions, however, I have perceived *that the idea of some such assistance having necessarily been afforded by local parties*, has been the natural consequence of a disbelief of any but persons residing at or in the neighbourhood of the locality being able to perpetrate acts requiring so much local information. This has arisen from it *hitherto being little thought that there could be any organised bands of depredators plundering so far from their homes* as the Dacoits under inquiry have been shown to do, having no other means of livelihood but by robbery. Failing, therefore, in looking *to any distance from the scene of a robbery*, it has always been a habit—perhaps an excusable one, considering the general suspicious character of those who have suddenly been injured without apparent cause—to attribute the deed to some act of enmity or conspiracy on the part of some one *thought to have borne an ill will against them*. Hence feuds, conspiracies, &c. on the part of relatives, or of enemies, have been perseveringly evoked as the cause of such acts as those under inquiry, and have led, in more instances than that of the attack upon the Talooka treasury at Ellore, to suspicion being unjustly attached to innocent persons; *never* (I venture to speak within the range only of my own experience) *to parties out of the immediate circle of those with whom the plundered family, or the local Police, may be acquainted*. The mind is perplexed to discover who could have been the ruffians, and the outrage, consequently, is at once laid to enmity; and the Police, at a loss in rendering a good account of their vigilance and efficiency to their immediate superiors, *are too ready to catch at the suspicion*, and, unhappily, often too successful in extorting some confession or approach to a confession on the part of some one or other who *may be unfortunate enough to be included among the supposed inimical persons*.

4. Such confessions, however, as I may be permitted to suggest in the case under inquiry, are easily discovered to be spurious, by comparison with the circumstances of a robbery *as it actually took place*. To be genuine, they should correspond, *in all they comprise*, with some of the facts of the outrage. For it is a marked feature of a forced confession, *that it seldom contains any connected account of what happened on the occasion*, however cleverly some of its leading facts may be touched upon. And such may be found to be the case in the present instance,—particularly if the statement of the approver Kunkia be also considered at the same time.

5. It has been urged in defence of the conviction of the men who were punished for the attack upon the treasury at Ellore, that it was difficult to believe *that so small a gang as of twelve persons could venture to attack a guard*

and another at Chandkowta (Sholapore), which was brought about by a revengeful son for the murder of his father's mistress (vide Dacoity No. 29, page 84); the dacoity at Ghorebunder, in the Northern Konkun (No. 10, page 73), may also be an exception.—C. II.

of a Naique and six Sepoys from the regular troops ! and the papers now furnished have been prepared for the purpose of showing how little these Dacoits have cared for such guards when bent upon their bold design of obtaining a booty wherever marked down by their leaders. And if it will be considered, the general listless state of the population of a town or village, whether guards or inhabitants, at the hour that has been so well chosen by the Sansiah Dacoits (the most desperate of all classes of professional robbers throughout India) as that at which they invariably commit a robbery, namely close upon nightfall, it will readily be apprehended, that the account rendered by the old man Bhow is very consistent with general fact.

6. I have to repeat my regrets at not earlier having been able to furnish you with a reply to your letter.

I have the honour to be, &c.

(Signed) C. HERVEY, Captain,
Assistant General Superintendent.

Assistant General Superintendent's Office, Belgaum, 13th November 1851.

EXTRACT Paragraph 6 from a LETTER from CAPTAIN C. HERVEY, Assistant General Superintendent, to Mr. J. D. INVERARITY, Magistrate of Belgaum, No. 128, dated 24th July 1852.

6. I have now had so many instances before me of confessions stated to be made in the districts, as to gang robberies, any one of the circumstances attending which, *such as could only be known to the actual robbers*, has so seldom been mentioned by the alleged confessing parties, that I venture to lay before you a letter on this subject, No. 178, dated 13th November 1851, I lately addressed, in another similar instance as the present, to the Session Judge of Masulipatam, as perhaps pertinent to the present inquiry ; and to my suggestion in it, I would beg to add, that, in like manner, it should not always be regarded as a proof of guilt, the fact of some portions of the property plundered by the Dacoits *having been found in the possession of the suspected parties* ; it being a part of the system of professional Dacoits to throw down portions of the booty here and there, *with the very view to suspicion being attached to those who might be heedless enough to pick up and appropriate the same* ; and to this is to be attributed much of the impunity they themselves have hitherto experienced.

EXTRACT Paragraphs 7 to 13 from a LETTER from CAPTAIN C. HERVEY, Assistant General Superintendent, to Mr. J. D. INVERARITY, Magistrate of Belgaum, No. 173, dated 22nd October 1852.

7. I would solicit particular attention to my proceedings in the Appendices marked A and B, in which I have noted carefully the grounds for believing that the Têlee (oilman) upon whose house this gang robbery was committed, and the other members of his family, also the Police of ———, perjured themselves throughout, and that the confessions alleged to have been made by three of the five convicted parties were unreal and *made up*; of which they will be seen to bear unmistakeable proofs, when compared with each other, with the evidence with respect to those three men, and with the circumstances of the robbery itself; and that, therefore, there resulted serious cause for apprehending that the confessions were, in fact, extorted from them, as they declared to have been the case, as well to the Second Assistant Magistrate as to the Session Judge, at the time of their trial.

8. These confessions, equally with the evidence of the Têlee, and of the other indicated parties, will be found to contain inconsistencies with truth and contradictions; and if it be an acknowledged principle, that the whole of a confession should be given in evidence, that the whole account a party gives of a transaction should be taken together, and a fact disadvantageous to himself should not be received to the conclusion of facts favourable to him, it would seem fairly to follow, that if a person's alleged confession, on the whole, *embraces only the outward and publicly well known features of a transaction*, but is eminently wide of truth when entering into details, and remarkably at variance with the evidence given in the case with respect to those very details and to his own part in the transaction, *such circumstances should be considered as facts favourable to the accused*, inasmuch as that they prove a want of corroboration *aliunde* in his account of himself—I allude particularly to the confessions under inquiry; and must leave it to be considered, from a perusal of these documents, to what extent I am justified in the remark. .

9. Independent, however, of such a consideration, it appears clear, that if the gang robbery at ——— was the act of the Dacoits in my custody, there arises direct evidence of the falsehood of the confessions, and of the innocence of the convicted parties; and, consequently, further proof of the base part played by the Têlee, and of the bias his conduct had upon the evidence of his wife and uncle, leading them into the contradictions and malversations in which they, as well as himself and the Police Patel, have now been detected.

10. I would venture to bring to your recollection the case of the dacoity at Gokak, in February 1846*—how nearly similar conduct on the side of the plundered parties brought an innocent person to condign punishment. On proofs adduced from this Office, of that outrage having been the act of Dacoits from Hindoostan then in my custody, the accused man prosecuted those parties, and the result was *their conviction and sentence to fines and various periods of imprisonment*. It had been my endeavour to dissuade him from proceeding against them,† and rather to remain satisfied with the establishment of his own innocence. The emphatic reply was,—*They would have had him hanged had they succeeded in establishing their accusation against him!* And I adduce that circumstance as an example of the present case, that under the law on which all the arraigned parties, ten in number, were committed for trial, they were liable to the extreme penalty prescribed therein for an offence of such a nature.

11. So serious, then, might have been the result of the trial, that I submit for consideration whether, upon the issue of the present inquiry, the Têlee and his family should not, as a public example, be driven with ignominy from their present village, the punished parties restored to it with marked consideration, and the Police Patel and the members of the Police, mentioned in the convict ——'s confession, deprived of place and employment, and the Police Patel himself heavily fined.

12. I am led to this suggestion, because, even with the encouragement I have been honoured with by Government to use my utmost endeavour in such cases, to enable it to make every reparation to parties who may have been wrongfully punished, and with every consciousness of the duty being a laudable one, I find myself drawn into these inquiries very unwillingly; and I would, therefore, have it felt, that it is not in vain that the misconduct of the Native Police is inquired into and brought to light, when so calculated, as it was in the present case, to mislead and misdirect their European superiors.

13. My part in bringing to light such transactions, arising out of the nature of the duties with which I have been publicly entrusted, naturally places me, I feel, in an invidious position. Over that—from the manner in which such acts are discovered to have been the deed of professional Dacoits, deposed to as they become, by the approvers, *not with any especial reference to any one particular act of crime, but elicited in the course of the examination to which they are subjected with the view to ascertaining the number and nature of those they may have committed at different periods during their career*—I am satisfied it will be perceived that I have myself no control. But the question arises, to

* Vide Dacoity No. 56, page 100.

† They were his uncles.

what extent may not such instances as the present of the conviction of innocent persons become multiplied, and how check for the future all chance of any recurrence of such convictions? With respect to the latter, it may occur to Government, that its sense towards the parties through whose agency false witness has been borne, and evidence suborned, when so palpable as in the present instance, should be summarily marked, as the most effectual means of deterring others; and with respect to the former, it is a matter beyond conjecture, and I must trust to continued support in the performance of a duty of so unpleasant a nature.

(True extracts)

(Signed) C. HERVEY, Brevet Major,
Assistant General Superintendent.

REPORTS
ON THE
WANDERING TRIBES
OF THE
BOMBAY PRESIDENCY.

WANDERING TRIBES.

No. 114 of 1848.

From Captain C. HERVEY,
Assistant General Superintendent,

To J. G. LUMSDEN, Esq.,
Secretary to Government, Judicial Department, Bombay.

Dated Belgaum, 23rd November 1848.

SIR,—I have the honour to reply to your letter No. 3333, dated 9th September, on the subject of placing restrictions on the vagrant tribes infesting the Southern Muratha Country.

2. The colonisation of persons hitherto free and unrestrained wanderers, homeless, free to do and doing as their inclinations prompt or necessity compels them, with a view to withdraw them from such a state of wildness, and to make them members of a general community of settled and peaceful occupations, is worthy any attention Government can bestow; but as a question of sound social policy, desirable for their sakes, and congenial with our national sentiments as to a kind and generous supervision of the people we govern, the subject is of such importance, that no incidental reasoning or suggestions ought to lead us into a purpose, which in all its considerations must, *practically*, be most difficult of attainment.

3. The *habits* of the people to be modelled might be the first consideration; whether the adaptation thereof *to the customs of the society among whom they are to be placed* may be reconciled naturally; or whether they are not of such a nature, or peculiarity, as might render any attempt at their reformation, because inconsistent with the idiosyncrasy of those people, a vain thing in its results.

4. It is reasonable that, where the people, though wild and unrestricted, are simple and honest; or, though predatory, do not form a distinct race, gradually to reclaim them, and induce them to mix with their fellow creatures, and at length to become settlers, may be accomplished; particularly when

the spread of civilisation, and, through it, the absorption of the land, and the measures by which it has been apportioned to the inhabitants of the towns and villages of the country over which the tribes were accustomed to wander, render their means of livelihood precarious, and reduce their wanderings into trespasses.

5. But when the habits *are predatory and lawless*, such as those of the tribes immediately under reference are asserted to be, and the people composing them at the same time consist of distinct and peculiar races of men, I beg respectfully to state, the possibility of settling such persons in agricultural districts must be a matter far more difficult of accomplishment.

6. The tribes of vagrants frequenting the Deccan—which they have done always, for there has been no new inroad on their parts fresher than our own occupation of India—have been, and I believe still are, for the most part, *thieves and robbers by hereditary profession*. The many facilities for plundering that offered under former rulers caused theft and rapine to become inherent in their disposition,—from their own unsettled habits of seeking for subsistence wherever, perchance, it could be obtained.

7. These facilities were the consequence of the peculiar constitution of the society of the *permanent* inhabitants of the land,—whose attention was so much taken up in aggrandisement and aggression, in local feuds, or in serving the Chiefs of whom they might at the time be the partisans, that there could not exist among them any general league for the suppression of persons who, without taking any part in their affairs, were able to take advantage of the general consternation and apathy that ensued, and thus easily to prey upon and to despoil them.

8. Such a state of things has passed away. The same facility for plundering is, however, stated to exist; and its continuance may perhaps be traceable to the predisposition to rob, where such from habit has become the only method of livelihood; and to the continued unsupervised condition of districts having extensive waste lands that form the haunts of the depredators.

9. Regarding them merely as a set of rapacious vagabonds, eking out so precarious an existence as by robbery, and living from hand to mouth, the belief is readily entertained, that it cannot be a matter of much difficulty to restrain them in the present day, by locating them in colonies; and it has been produced as an instance, that a large body of *Pindarees* was so located some time back at Dharwar, with the greatest success, who have settled down into peaceable people, evincing no disposition to return to their former predatory habits.

10. But the Pindarees were not essentially wanderers: they had fixed settlements, where they were permitted for the most part to remain unmolested, as often answering the purposes, as mercenaries, of the neighbouring large

States that were continually at war with each other; and because, if actuated by revenge for any interference by any of the contending parties, they became a formidable aid to the opposite side. From these settlements (on the other side of the Nerbudda), they would sally forth in hordes, plunder and devastate the countries they would visit, and return with their booty to their abodes; where, from the gigantic power their Chiefs obtained, the dread of making any movement against them, and the treaties with them on the part of the neighbouring States to exempt these from their terrible visitations, by formally making over to them certain districts, they might speedily, from a robber confederacy, have been converted into a regular State.

11. As do the *Lumbanees*, and the other nomade tribes under reference, the Pindarees formed not any peculiar tribe or people. As before observed regarding these people in a former report,* they were bandits, composed of the refuse and scum of the land, of every denomination and creed, associated together for the sake of plunder; they had not any peculiar social institutions; no particular language not understood by any other people; *Pindaree* was merely *their name*; mean and arrant cowards, with not one redeeming virtue either in woman or in man, they flocked and congregated together with impunity in villanous combination, their safety in their host, and their savage cruelties a dread shield in their defence.

12. When these miscreants were suppressed by the vigorous measures of the British Government, when expelled from their homes, their confederacy broken up, and their Chiefs gone, they could not possibly, under their circumstances, keep up any peculiarity *as a people* that was not theirs essentially! They therefore easily settled in families, where large towns offered them a means of subsistence, by their hiring out themselves as conveyers, by means of their tattoos or ponies, of baggage and merchandise during the fine season, or of firewood during the rains; their own extraordinary endurance of the fatigues of long marches, to which they had become habituated by their former active lives, and the sturdiness of the above little animals, making this occupation to accord the best with their inclinations. They are to be met with in nearly every city or large town in the Deccan; for although, as has been observed, a large body was invited to settle at Dharwar, similar parties have been led to do so of themselves in other places.

13. The tribes under reference, and the Lumbanees particularly, must, however, be otherwise considered; and it is the peculiar feature they present *as unmixed races*, preserving with the greatest jealousy their individuality, that should be well marked in contrasting them with other people.

14. The Lumbanees forming the most numerous of any of the wandering classes visiting this side of India, and their acts of depredation being, I

* A Report on the Darakurrees, or mounted highwaymen, dated September 1844.

believe, more frequent than on the part of any others in these districts, they, I apprehend, must be more particularly alluded to by the Judicial Commissioner Southern Muratha Country.

15. They are more commonly known by the name of *Brinjaras*, whose chief ostensible occupation is to convey grain and salt to distant parts of the country, for which purpose they keep up a large quantity of bullocks.

16. Salt, as an article of such general consumption, being in such constant demand, and procurable only from the sea coast, these people, being the principal importers thereof, have continually to pass over, in most instances, large tracts of country; and, from the time occupied in the journey, they become lost sight of, for a period, to those by whom they have been hired. As their convoys on such occasions, or if on any other errand, move steadily along the country, their progress does not excite any particular attention on the part of the inhabitants; and as, on coming up to their ground in small parties at different times (which they do purposely, to make it a tedious matter to muster them), they invariably halt for the night on the open plain at a distance from, though in the neighbourhood of, some village, and are generally gone by daylight, but little inquiry is made concerning them by the village authorities. Their numbers are not questioned, and beyond, perhaps, sometimes a passing question as to their destination, or from whence they have come, on the part of some irresponsible person who may have met the train,—when some very distant and to him unknown places are vaguely given in reply,—they come under no other notice whatever; and, as is oftentimes the case, will even reach the coast, or wherever their destination, without having created any remark, or caused any precautionary measure on the part of any of the authorities of the country through which they may have journeyed, whether for salt or any other purpose. And, consequently, every facility is offered to these people to dissemble, or to cloak any dishonest design. Thus, while the old men and women proceed steadily with the train, a party of able-bodied men strike off during the night, or as opportunity may offer, to some distant place previously fixed upon, rapidly perpetrate a robbery there, and rejoin the main convoy during its straggling march of the following day; the number of persons of which it was composed not having been ascertained, any reference to the authorities along the direct march of these people, on the part of the Police where an outrage has meanwhile been committed as above, being of no avail,—the answers serving rather to screen the offenders than otherwise. For on such occasions, the tact of the Naiks or leaders is such, that a reference to the Police along the right line of their progress invariably convinces *that no deviation could possibly have taken place*. Thus the real offenders pass unmolested along, while many other men become accused, confined, are sent from Kutcheree to Kutcheree, and very ill used.

17. Many, again, are cattle-stealers. Some sections of the tribe deal in cattle, stolen no doubt, with immense droves of which they are often to be met, when the same facilities are presented for robbing and evading detection. Of these cattle-dealers several 'tandas' have but very recently passed into the Southern Muratha Country from Khandeish. Others kidnap children; a part coin false money; and some are Thugs. In short, they are everything that opportunity will permit them to be.

18. They form, however, a distinct race of beings, and are remarkable. Their quaint aspect and physiognomy must often have occasioned remark on the part of an European observer; the intelligent countenances, and wiry strongly-knitted frames of the men, but ill according with their mean and scanty dress; while the fantastical party-coloured costume of the women, their arms, generally from shoulder to wrist completely encased in bracelets made of bone or ivory, or of a particular kind of wood, shells and coins curiously strung together round their necks, and hair ornamented in like manner,—give a strange flighty appearance to the natural wild air of their always expressive and sometimes good-looking faces.

19. Except that, owing to the circumstances of the different countries, their occupations may vary, I think these Lumbanees are very much to be compared with the Gipsies of Europe. I have never yet been able to learn from any of them as to their real origin; they do not seem to be aware of any circumstance from which they can date it, stating that they have always from generation to generation been 'khana-buh-dosh,' ('house to back'—*i. e.* of no fixed homes). Their marriage and other ceremonies differ from other peoples'. Their notions are odd; their religion undefined; they have a peculiar dialect, understood only among themselves, though generally they can fluently talk the language of each tract they visit; they do not intermarry with other people; they live in no fixed abodes, though they will often have their tandas or encampments in a single neighbourhood for a long time together; they note the stars, take omens, and rigidly observe them; and their singular women would scarcely seem to belong to such men, from their very dissimilar appearance; but whose quaint dresses cannot be attributed to any vanity on their parts, but rather as an index of the tendency of their minds, exhibiting a wildness of air in harmony with the real condition of their habits and feelings. As good wives and true, they are as remarkable as the Pindaree females were otherwise.

20. The *Kaikarees*,* again, form another distinct race of people, of similar

* Captain Hervey's report of the habits of Kaikarees as gang robbers (Dacoits) was not written till the following year; it is the leading document in Vol. I. of Selections from the Records of the Bombay Government in the Police Branch of the Judicial Department.

peculiarities; but they are chiefly basket-makers, and they also wander about with their families from place to place, and acquire, consequently, for reasons already given, the same opportunities for committing theft, though not often visitors of the Southern Muratha Country.

21. The *Wuddurs*, another tribe, are diggers of wells and excavators generally: they assist in raising the mud walls of houses, and work in quarries; and in search of such occupations, they too roam about, and are thieves. Two or three Wuddurs are frequently to be found concerned in every common gang robbery in certain Talookas. But I am not aware of any peculiarity in them, *except that they eat field rats, which, and village pigs roasted entire*, they consider great delicacies. They are, though very useful, a low race of men; and perhaps of no consequence in the present consideration.

22. *Pardhees* are a class of people who snare game, in quest of which they wander from jungle to jungle with their wives and children. Their women beg, and they are a miserable, half-starved people; and I think may also be excluded from the subject.

23. There are also wandering minstrels; professional mendicants; persons called *Teen-namahs*; venders of drugs, styled *Golhas*; showmen; bird-catchers from the Madras Coast, &c. &c.*; all of whom no doubt, more or less, are thieves, but who deserve no particular notice; for, travelling as they do from town to town, they certainly ought not to escape the observation of the local Police.

24. The *Bedurs*, again, are another numerous class of people who are expert burglars (*Khanchôrs*). They travel to a great distance where to commit a robbery; but for the most part *they reside in villages*, and in the Belgaum Zilla have settled principally in the Padshapoor Talooka; and at Deshnoor, Hoogurtee, and Gujjumhall, in that of Sumpgaum; so that they may not be included in the present classification, though they have migrated from the Shorapoor Bedur province, of which they form the chief population.

25. It remains, therefore, to consider the question of putting down those erratic tribes who prey the most upon the inhabitants of these districts; and it is proposed to place a stricter surveillance over them, or to locate them permanently in our districts.

26. With regard to the latter object, it is plain that while such people continue united in colonies, and adhere to their peculiar habits and customs of intermarriage, &c., and retain their exclusive language, they must continue to be very troublesome races among inhabitants so constituted as are those of our districts, who rely so much on the care for them by the Sirkar without doing anything for themselves; generally, except immediately interested in the result,

* "*Ambubaiarum collegia, pharmacopolæ, mendici, mimæ, balatrones, hoc genus omne.*"

not even caring to assist the exertions of the local Police : so unlike the rural populations of other countries, *such colonies would continue to prey upon their neighbours* ; and evil must result from any attempt to reclaim them in such a manner, and endless trouble ensue.

27. A more rigid surveillance over these "*Rôdeurs*" on the part of the Police would appear to me, therefore, to be the best, and, under present circumstances, *the least irksome alternative*. The law provides for requisitions for security on the part of district Magistrates, from persons of a suspicious character ; but, unfortunately, such measures often get nullified, owing to some informality or point of technicality, as brought to notice in the appeals made to the superior Court on such occasions, induced, as these so often are, by the accommodating ways of Vakeels or other Native agents about our courts of justice, who, understanding our constitutional tenacity on the subject, take the opportunity to lay great stress upon any undue restrictions on "the liberty of the subject," when probably the alleged oppressive acts have been but measures of precaution on the part of a watchful Magistrate, against persons possessing, perhaps, an irrational liberty.

28. When, from the circumstances of the common apathetic habits of the people of our districts ; the venality and general inefficiency of the Police ; the present, though I believe amending, paucity of the bulk of the population, compared to the extent of the country inhabited ; their consequent small means for cultivating the land, from frequent poverty in time of any scarcity ; the fact is notorious, from experience, that most of the robberies and other acts of plunder that take place may be traced to the unlicensed liberty the people under consideration are permitted to enjoy, the discretion of a Magistrate must be considered small indeed, if he cannot be permitted to exercise a latitude of power in placing just restrictions over them,—a power that may not, perhaps, be distinguished in *the very letter* of regulations so admirably framed for the maintenance of order with a due regard to the well-known great principle of a proper liberty of the subject in the ordinary jurisdiction of our territories, but on the whole certainly implied *in the spirit* of those laws, and often assumed in extraordinary cases, with a view to the proper protection of that portion of the community, who, residing permanently in districts, tilling the land, and paying all dues and the demands of Government, are indeed subjects who have, beyond all others, the best claim to protection, by whatever means extended, against the violent acts of the unbridled men of whom they are the helpless victims.

29. A greater discretionary power allowed to Magistrates ; the compelling all bodies of wanderers, when appearing in any Talooka, to furnish good securities *in money*, or to suffer detention, or to depart the way they came ;

naming in each district certain villages and towns, where the Police may be tolerably good, at some one of which each tanda must be made to encamp, if purposing to remain any certain time within it, which they must declare, or suffer detention in default of security, or be made to depart as above; and the attaching, the while, an intelligent peon to each tanda, *to be subsisted by it*; giving notice to the neighbouring Police into whose charge it may be about to pass when leaving a district; mustering the men of the tanda, and, in the absence of any man by nightfall or at dawn, exacting from it the amount of any robbery that may have been committed during the night anywhere within eighteen miles off from the encampment, except it points out the thieves; intimating forthwith to the several local Police Authorities the arrival within the district of all such people; mentioning, at the same time, the strength of the tanda, and the name of the Naik thereof,—would, I respectfully suggest, be remedial measures, of a precautionary nature, altogether necessary for restraining the present predatory habits of these people; and preferable to permanently locating them in colonies, unless they can be forced, by pressure, to blend with the rest of the community, forego their distinctions as any peculiar race, and earn their livelihood, like other men, by honest industry; to enforce which, *unless they were all convicted robbers*, might not only be justly considered a very great violation of the principles of freedom, and an interference with the prejudices of caste, but even, if enforced, would, as impelling a very difficult people to civilisation, require such continued efforts, and sustained zeal and vigilance, during successive generations, as to become, because nearly impracticable, a work almost of supererogation.

30. As to the rest, though I regret the serious check I lately experienced in the commencement I made against that portion of the Lumbanee tribe who I believed to be in the habit of extending its incursions into these districts from over the border, the gradual suppression of these people as professional and hereditary robbers will probably be effected under the operation of the Dacoity Act, and of Act XI. of 1848, lately framed—when the leaders and principal members of their gangs, when conditionally pardoned, may always be employed with confidence in Police duties, and in other establishments, as public servants.

I have the honour to be, &c.

(Signed) C. HERVEY, Captain,
Assistant General Superintendent.

Assistant General Superintendent's Office, Belgaum, 23rd November 1848.

No. 90.

DACOITY DEPARTMENT.

To J. G. LUMSDEN, Esq.,

Secretary to Government, Judicial Department, Bombay.

SIR,—I have the honour to acknowledge the receipt of your letter under date 30th March last, No. 1677, and accompaniments, in which I am desired to state what, in my opinion, are the measures best calculated to protect the rural districts of this Presidency against the predatory habits of the wandering tribes.

2. Believing that the evil complained of may be traced, in the first place, to the peculiar composition of the people of the districts in which these wandering tribes have been accustomed to roam; who, formed of incongruous masses of men of opposite natures and different habits, have never been able to enter into any general league for their mutual protection; also that its prevalence may, in a great measure, be consequently laid to *the Police** as hitherto constituted, consisting, as it mainly does, of a body of men, again, quite different from the people it is intended to protect, without any decided superiority in character, and, therefore, from its seldom *representing*† the latter, inadequate in real fact for their thorough protection,—both being without any cordiality between them, —I am, on the whole, disposed to regard that less as criminal on the part of the tribes under inquiry which, in its causes, may, without fear of the imputation of being*too considerate, be fairly looked upon rather as unfortunate in persons often treated with too little consideration, because universally believed to be what they not always are.

3. The people under inquiry, according to all accepted traditions, were originally stragglers from the mass of the first settlers of other countries;—cut off from all intercourse with whom, and, because of their restless habits, meeting with no communion with the regular inhabitants of the regions they visited,

* This report was written before the Police of the districts (Bombay) had been based on its present efficient footing.—(May 1858.)—C. H.

† I have made use of this expression with reference to what I have before alluded to in my two last Annual Reports, viz. that the Police in most districts do not accord, in their own training and habits, with the people they are set to watch over, who often vary in character, according to the features of the tracts they inhabit. The Konkun has been produced by me as an example, of which the Police totally differ from the inhabitants; and I may take the liberty of adducing, in further explanation of my meaning, the instance that lately presented at home, where, on the occasion of the late National Exhibition, it was found necessary, for the prevention and detection of crime on the part of strangers in the crowded metropolis, to employ policemen from their respective countries, as the best able to cope with the criminals thereof. The Shetsundee establishment lately introduced in the Belgaum Zilla nearly approaches what is required very much everywhere.

they easily lost all the civilising influences of their original homes, and merged, as generation succeeded generation—any settled habits having ceased with their earliest migrations—into races of wanderers, only differing from each other according to the stock from which each originally strayed, and according as the circumstances of the countries they found themselves in, and as productive employment, or its want, and the difficulty of subsistence, may have combined towards the formation and final development of the habits by which each are now distinguished.

4. While all, therefore, became confirmed wanderers, only those would have adopted predatory habits, where either their own limited resources, and the want of union in the inhabitants, or the example these themselves set under no regular government, offered temptations to plunder, or opposed no discouragement to the lawless ;—the success met with in the first exploits of violence, or failure, establishing the different degrees of boldness in and adherence to such pursuits ; leading the timid or detected to depend more upon their own industry, and the fearless and successful to care less for any honest means of livelihood, while able to obtain it by appropriating what belonged to others ; but, at the same time, setting *all* to the adoption of some settled *ostensible* mode of living, by which their honesty *might be presumed*, however precarious to themselves its assumed form, whether real or superficial.

5. Inhibited at the outset from any intercourse with each other, each tribe displayed the same prejudice of caste that distinguished its parent race, and, therefore, would have no sympathy of interests with any other ; each steadily pursuing its own course, according to the habits it had been led by the above combination of circumstances to form, and preserving the same distinctions as distinct people that so characterise all eastern races. Thus, the pursuits of one, if unlawful, would be no test of a want of probity in others ; nor would it be just, while being assured of the dishonesty of some, to call into question, although vulgarly done, the employments of others, and thus, by a sweeping condemnation, to restrain liberties of which we are ourselves generally so jealous,—a continuance whereof might lead to a course of rectitude, but denied, might, while becoming a punishment not deserved by many, shut out from such as may not be of confirmed evil habits, all opportunities for atonement or amendment.

6. But there is another view of the question, viz. the impolicy of imposing undue restrictions on any people, through deference to a general mistrust only as to their habits ; for it is not to be overlooked, that the majority of common opinions are often the least enlightened. For my own part, I believe the whole of the wandering tribes to be very much attached to the British Government—very possibly because of the leniency of laws, under the operation of which so many of them have prospered : but that is no disparagement of our rule,—its justice, and careful avoidance of all chance of confounding the

innocent with the guilty, are the transcendent qualities that make these barbarians so much attached to it, that even the most reckless Dacoit—the man who has never robbed without committing murder—has often, when apprehended, exclaimed to me, that the justice of the Sirkar was sifting and consistent ('Dood ka kurta dood, pani ka pani,'—a favourite expression among these wandering tribes),* and that he had no fear as to his being set at liberty if there were the slightest doubt as to his guilt. So that how much more might we not expect, on the occasion of any necessity, from the favourable temper of those we have protected when really guiltless, and suffering under the general bane of an illiberal suspicion?—a suspicion caused by the seeming mystery that attaches to all their movements, suggesting notions of their guilt, and which cannot be too warily watched and controlled; it being a proneness inseparable from most natures, when suspicion has been excited, to draw inferences therefrom, and to deduce, consequently, from circumstances that might be innocent, criminal pursuits or predilections,—a *Police authority who doubts the existence of truth or honest purposes being seldom ready to sacrifice his imagination to any supposition of his being mistaken.*

7. The object, however, for the present inquiry, is, how to circumscribe the facilities which exist for the perpetration of crime, arising out of any undue license to wander, the tribes under consideration may have acquired; and I have therefore to submit what, under present circumstances, and under the present Police system, would appear to be the best alternative for checking crime on the part of these people; while doing which, it will be necessary not to lose sight of what I have above ventured to lay before you, viz. the distinction between those tribes that, presenting very little difference in appearance from those that should be guarded against, are their prototypes only, inasmuch as regards the similarity of their *real* occupations with what are but only the *ostensible* means of the livelihood of the others.

8. I would beg, however, to submit to your notice, that the subject has already been entered into in my report No. 114, dated 23rd November 1848,† regarding the practicability of colonising these tribes; when, while submitting the objections to permanently locating such people in our agricultural districts, I ventured to propose (paragraphs 28 to 30) the measures it appeared to me were calculated to protect these from their violence; namely while recognising

* Meaning literally that, with us, "milk we keep to be milk, and water, water"—not taking one for the other,—i. e. not confounding the good with the bad; no admixture; black not white, nor white black. The expression is often used by a prisoner at the bar, by way of exhortation to the Magistrate or Judge, to *judge properly*; but like as Thugs are known to each other by their language, may a Dacoit be often discovered simply by the use of the above phrase, it being peculiar to the profession.—C. II.

† Vide the preceding letter.

their license to wander wherever they chose, as long as they remained peaceable, or had honest means of livelihood, which many undoubtedly have, to limit the wandering of all others, who from being dishonest, would feel such a check, and the prevention caused by it in following their more questionable occupations,—for each predatory tribe has its ostensible and its real occupation; its *exoteric* and its *esoteric* identity; what is meant for the multitude, and what is known only to a few; for honest *all are outwardly*; and only among themselves are their real occupations known.

9. *But the dishonest pretend to be the good*, and these tribes have not been sufficiently studied to be readily or always distinguished from each other; the district Police, even, being as ready to confound the one with the other as anybody else. Hence it is, that, under the general suspicion and distrust with which these people are regarded everywhere, it not unfrequently occurs, that many of them become unjustly served; and the plan, therefore, I took the liberty to suggest, viz. that of placing all such tribes under a general surveillance, *was with the view to cause the least irksome restraint upon those of them who had nothing to fear*. For however suspicious their appearance, the Police would only have to be more on the alert, and greater precautions taken by the inhabitants of a place near which any such vagrants should happen to appear,—just in the same way as the appearance in the neighbourhood of Gipsies would, because of their well known character, lead people at home to look to the hen-roost, or to see that the barn-yard had been properly secured.

10. Having had no reasons for altering the opinion I had formed on the above occasion, I was lately led, under further continued observations of these tribes of wanderers, to again submit to notice my former suggestions; and I*therefore ventured in my late Annual Report, No. 52, dated 26th March last, to advert to the subject in paragraph 37,* in which I submitted, that the prevention of much crime might be compassed by the measures therein offered for consideration with reference to my former proposals, which had already met with approval; to which, therefore, and to my former report above alluded to, I would here beg to refer you. For, after an intimate acquaintance with most of the tribes, and continued experience, there appears to me nothing better to offer, being aware that the great object is, to protect the innocent in the pursuit of the guilty, and feeling sure that, according as such checks as proposed by me are imposed,—all operating towards the prevention of crime,—must the men such restrictions most affect or trouble be led, if the system against them be steadily persevered in everywhere, to bethink themselves how else they may exist?—and thus, as I hope, their minds be turned to seeking

* Vide page 44 of vol. I. of Selections from the Records of Government in the Police Branch of the Judicial Department.

honest ways of earning their livelihood, and at length to their no longer experiencing any restlessness under what before, while their conduct had been questionable, they had felt to be restraints.

11. I have therefore to repeat what I concluded with in the report already quoted (No. 114, dated 23rd November 1848), viz. that as for the rest,—that is, as for what may remain to be done against those tribes who have been, and are, professional robbers and thieves,—the same is amply otherwise provided for in the provisions of Acts XXIV. of 1843 and XI. of 1848, under which they can be tried and convicted; for they themselves feel, as many have frequently stated to me, *that while everything had hitherto failed in checking their depredations*, nothing had yet been devised to effect so well that object as the late proceedings against them by this Department under the operation of those Acts, which do not render it necessary for conviction to prove the *possession* of any stolen property, or that the culprits should be identified by *local* parties; by the failure of proofs as to which, they had always succeeded in evading the vengeance of the laws, and had found themselves at liberty to carry on their trade of robbery as often as set at liberty, and as long as permitted to wander about unquestioned.

12. In transmitting, therefore, a list of all the wandering and other predatory tribes, seventy-one in number, with which I am acquainted, with an account of the occupations of each, both ostensible and real, as probably assisting Government in any further consideration of this subject, I have the honour very respectfully to submit, that it will not, it appears to me, lead to any reform in the habits of these people, *to drive them away from Zilla to Zilla*, but that they should rather still be suffered, under the conditions proposed, *to go where they choose*, and be invited, and inducements held out to them, to locate themselves, *if they like to do so*; and that *no interference with their legal pursuits should be attempted*; while, on the other hand, they should be made to know, by some such system of general surveillance as I have been emboldened to offer, that they are under the observation of the Police wherever they may go; and that, if not prevented in committing crime, every means is adopted to detect the offenders, and to punish them with the utmost rigour of the laws that have been especially enacted for their suppression; *any half measures, when the offenders are professional criminals, having always been found to fail in producing any reformation.*

I have the honour to be, &c.

(Signed) C. HERVEY, Captain,
Assistant General Superintendent.

Assistant General Superintendent's Office, Belgaum, 26th May 1852.

A LIST of the WANDERING and other PREDATORY TRIBES in the habit of infesting the Districts of the BOMBAY PRESIDENCY, with their Occupations, both Ostensible and Real.

1. *Kulkorwees*, i. e. *Ran-Kaikarees*, some of whom occasionally, as long as they remain unsuspected, locate themselves at villages. Ostensibly, they are basket-makers; some will hire and cultivate fields (such particularly are many of those who frequent the Dharwar Zilla), and let themselves out as daily labourers; and are village musicians, &c.; but they are all professional gang robbers and burglars. They are to be found throughout the Deccan, wherein they are styled Kaikarees, but in the Belgaum and Dharwar Zillas, and in the Carnatic, they are known as Kulkorwees; in other places they are differently known and called, according to the country they may visit.

2. *Morikur-Korwees*, or *Poonjee-Korwees*, are a branch of the Kulkorwee tribe. Ostensibly, they are jugglers and showmen, and players on blow-gourds ('poongees'), and, under guise as such, they travel about. They subsist by gang robbery and burglary, and by passing base metal for gold. These are altogether vagabonds, and may be found in the Bellary and Dharwar districts. The *real* jugglers are a distinct people, called *Yergols*, and *Gólhurs*, residing particularly in the Madras territories; and these are *not* professional thieves, though some of them will occasionally join those by whom they are represented.

3. *Huggul-Kaikya-Korwees*, a section of Korwees, whose women are the thieves, thieving by day in regular gangs, under their respective Jemadarnees, or female leaders. Each gang is provided with a bunch of keys and pick-locks,* of various kinds and sizes. They resort to a village, pretending to beg for alms; when any house is observed to have its door locked up in any unfrequented lane, the inmates being gone to their fields, the leader picks open the lock, and enters, while one of her gang stands before the door, enveloped in her saree or dress and a basket upon her head, as though, to any passenger, at the door begging alms; the rest of the gang stand off at different distances. On the Jemadarnee coming out with her booty, she fastens up the door, and the whole quietly decamp. Should any one seem to have any kind of suspicion regarding them, while the leader happens to be within the premises as above, the woman at the door first engages his attention by producing a rupee, or half rupee, pretending to wish to be informed as to whether it is good or bad, and in doing so she purposely gets up an altercation, and then suddenly lays hold of him, and vociferates that he had been insulting her or taking liberties with her; upon which the other women, one by one, run

up and shove him about; and drag him away. The villagers gather round them, and thus, while attention is drawn off from the house in which the Jemadarnee is, she manages to slip out, and to make off with her plunder. Their men are basket-makers, and steal cattle. They perform all the ordinary household duties of the women,—looking after the children, cooking the food, &c. The women also pretend to be fortune-tellers: an old crone will, under such a character, go in the day-time to a house where only a female may be left in charge, and ingratiate herself with her, by pretending to know her history, what troubles her, or such like; what children she will bear, &c. She then requests her to place her 'saree' over her face, and then she breathes upon her eyes, blows into her ears, and mutters some supposed charms; and so on. In the mean while, one or two of her associates, who have been lurking close by, step into the house stealthily, and carry off whatever they can readily lay hands upon. After they have gone, the ceremony is pronounced accomplished; the housewife is uncovered, and the old woman departs with a present, leaving the now quite bewildered dupe to ponder upon what she has been told of her destiny—only afterwards to discover that the house has been robbed!

4. *Koonchee-Korwees*, another branch of the Kaikaree tribe: they make brushes for weavers' looms (called 'koonchees,' whence their cognomen). They snare game, and go about with dancing monkeys. They have not as yet been discovered to be thieves, or robbers, except that their women will steal, if they can; but they will pilfer ears of corn from the fields: on such occasions they are called '*Bhootté-Chors*.'

5. *Oop-Belgar-Korwees*.—These deal in betelnuts, salt, &c., and are carriers. They are not professionally robbers, but will sometimes join the gangs of Kulkorwees and rob with them.

6. *Agadee-Korwees*, or *Koot-Kaikarees*, buy women, and let them out as prostitutes, by which means they subsist. They locate themselves in cities, and in camp bazars. Some of them make and sell baskets and brooms. These, like the last, occasionally join the expeditions of the regular robbers of the tribe.

7. *Wajjuntree-Korwees* reside mostly in villages, where they own fields, &c. They are the *real* village musicians, and not robbers. Occasionally one or two of these are in the secret of the Kulkorwees, and will rob with them.

8. *Lumbanees*, or *Brinjaras*, are sellers of firewood, and carriers, and dealers in grain and salt; they also deal in cattle. Many of them are highway robbers, gang robbers, and cattle-stealers. They do not practise burglary; but sometimes some of them join the Korwees of Canara and Dharwar, in the latter crime. To be found everywhere in the Dharwar and Belgaum Zillas, and about Moondurjee, Copal, Shorapoor Bedur, Beejapoor, and indeed every-

where. Certain branches of this tribe are believed to be professional robbers, under the assumed disguise of those of the tribe who are really carriers, &c., but much has yet to be learnt regarding their habits as robbers. The Assistant General Superintendent has already reported upon them.

9. *Wuddurs* are excavators of quarries, wells, &c., and diggers of earth generally. They sell pickaxes and shovels, and raise mud walls, &c.; but many are entirely robbers, both by night and day,—at day on the highways, and at night in gangs upon houses. They are stated to wound and commit murder on such occasions; some join the *Kulkorwees* in burglary. But these people have not yet been sufficiently inquired into; for there are entire families of them who subsist by honest livelihood, and live apart from the robber portions of the tribe. They are called *Sunki-Wuddurs* and *Mun-Wuddurs*; but the section of the tribe called *Bhundee-Wuddurs*, who excavate quarries, and make and sell millstones, are not robbers.

10. *Gunttee-Chors*; are called also *Oochlés*. They are the *Oothace Geerees* of Hindoostan, and by us would be called pick-pockets and shop-lifters. They are permanently located in certain villages and districts, but periodically sally forth, attended by their wives and children, on their pilfering trade, and frequent bazars, fairs, and other crowded assemblages, wherein they dexterously contrive to cut off pockets, snatch away ornaments from women and children, and carry off cloth and other goods exposed for sale in shops and stalls. They practise by day, and do not rob at night, or on the highway. Originally, those of the Deccan are stated to have sprung from the *Wuddurs*.

11. *Bedurs* are, in the Southern Muratha Country, what the *Ramoosees* are in the Deccan, and the *Vasees* in Hindoostan. They live in villages, in general service as sepoy, or as cultivators and labourers. They are also *Wutundars** in the capacity of village *Tulwars*, *Naiques*, *IIullubs*, *Shetsundees*,† and village watchmen generally; but many of them are nevertheless secretly gang robbers and highwaymen. They are also styled *Punjgalls*. They have yet to be inquired into. The bulk of the population of the province of Shorapoor *Bedur* consists of *Bedurs*, or *Beruds*, as the name is sometimes pronounced.

12. *Jutts* are Mussulmans, and in Hindoostan, as well as frequently in the Deccan, are known as *Mooltanees*. In the Carnatic, including certain portions of the Southern Muratha Country, they are called also *Kummés*, large bodies of whom used to be in the service of the refractory *Deßsacc*‡ of Kitttoor (near Belgaum). Ostensibly they take service, and cultivate lands; but among robbers they are known to be altogether thieves, burglars, gang robbers, horse-

* Landholders on service tenures.

† All these are hereditary village officers.

‡ An hereditary provincial title. Named also the *Deshmook*, or principal provincial officer; formerly an extensive landholder, and having certain rights upon the revenue of the villages that comprised his *Deshmookce*.—(May 1858.)—C. H.

stealers, cattle-stealers, and highwaymen. They are stated to have been so from long descent, but have yet to come under further observation. They frequent the Southern Muratha Country and the Nizam's country. Many Mool-tanee Dacoits have been seized by the Officers of the Department higher up, but where they are a different people.

13. *Chuppur* or *Chapah-Bunds* are Mussulmans, and some of the calling too are Telingees and Kongahs. They reside in fixed villages, particularly in the valley of the Krishna river, in the neighbourhood of Chimulgee and Moode-behal. They periodically sally forth and utter counterfeit coins, at making and passing which they are most expert and cunning. They spread everywhere in the Madras and Bombay Presidencies, and in the Nizam's country, penetrating even up into Hindoostan. They have already been especially reported on.*

14. *Ramoosees* are village watchmen, receiving their regular apportioned village 'huks' or rights, for the performance of such duties. They undertake to track up all robbers, failing in which they used to have, according to old custom, to make good *half* the amount of the value of the property plundered,—*to be able to do which, they would go and rob some one else!* Some are cultivators, but secretly they are gang robbers, highwaymen, and burglars; and they often commit murder when engaged in robbery. They exist everywhere in the Nuggur and Poona districts. They are not essentially, however, the Bedurs already noticed, though similarly employed, and many, like them, are hereditary robbers.

15. *Kathkurree*,—makers of catechu, which is produced by the destructive distillation of the 'khair' tree, or *memosa capchu*; they also make charcoal, collect gums, and frequently take service as farm-helpers: but in this they are inconstant, leaving their employment without reason, and sometimes without wages. They are nomadic during the fine season; and in the rains they settle down in small huts near villages, and cultivate gourds of kinds, and some little rice. *Towar* appears to be their residence during the rains; but, as soon as the crops are housed, they resort to the jungle to make charcoal, &c. They are not admitted to the rights of Hindoos. The women wear large strings of white and other beads about their necks, and, though not so industrious as the men, are still to be found working as labourers for the Koonbee or cultivator. They commit petty thefts of grain, fowls, &c., and occasionally rob a benighted traveller of his clothes. The number of this tribe is small, and I think they are allied to the Dhêrs.

16. *Katorees*, an aboriginal race of very diminutive men, infesting the hills and wilds of the Northern Konkun, and known as *Maila Bhoels*. They are incorrigible robbers and highwaymen, pretending to sell firewood, forage,

* Vide the imperfectly compiled report regarding them in Vol. II. of Selections from the Records of the Government of Bombay in the Police Branch of the Judicial Department.

charcoal, and wild honey, &c. and to take labour. They are of low caste, and are not allowed to reside within any village. There is always great mortality among them whenever they become imprisoned. They differ in little from the Kathkurrees.

17. *Pardhees*.—These often reside in villages, and are village watchmen, like the Ramoosees. Such men pretend to be the peaceable portion of the tribe of Pardhees well known as travelling ‘shikarees,’ snaring and selling game, and living by the proceeds. They have matchlocks, swords, and spears, and hunt large game; but they are bold, and very indefatigable robbers, climbing over the highest walls. They are to be found in Khandeish and Berar, they go long distances to commit robberies, and are said often to attack and plunder treasuries.

18. *Bheels*, like the Ramoosees, live in villages, and are watchmen; but rob and thief as often as opportunities offer. They inhabit Khandeish, and the hilly ranges beyond it. Those located between the Taptee and the Satpoora Hills, north of Surat, are known as *Wahgehs* or *Wusawehs*, who are great robbers, and have been especially reported upon by me.*

19. *Oochlé-Kaikarees* form another branch of the Kaikaree tribe, and, like the Oochlés before noticed (No. 10), are bazar thieves and pick-pockets. Their homes are in villages, like the *Gam-Kaikarees*. They attend fairs, bazars, &c., and contrive in the crowd to snatch away ornaments and other property. Both men and women are so employed, and even their children. They travel about on such excursions, and are to be found in the Poona and Sattara districts.

20. *Bamptés*, another well known class of petty thieves. They look like Murathas, and they reside principally in villages, where they have fields, as a pretence only. When on their expeditions, they assume the garb of Brahmins, wear large ‘pūgrees,’ and visit bazars and such crowded places, in the same manner as the Oochlés. They have the address to be allowed to sit near Brahmins or other respectable persons at their shops, while conversing with whom, they adroitly manage to appropriate anything valuable that may be within reach; they alight also where travellers may be, and get to sit and talk with them, and then pilfer them in the same way. They infest the country about Meritch, Tasgaum, Kolapore, Sholapore, Poona, Sattara, &c., and are the expertest of the light-fingered gentry.

21. *Bazeegurs* are Lingayuts, live in villages, and cultivate lands. Seven, eight, nine, or ten of them repair in a body, magnificently dressed, to the great fairs or markets, with rings on their fingers, and valuable necklaces round

* Vide Vol. I. of Selections from the Records of Government in the Police Branch of the Judicial Department, page 46.

their necks. One or two of the gang pretend to be Sowkars,* and, seemingly as such, establish their booth next to that of some rich merchant, come, like them, to the fair, displaying bales of fine and valuable cloths. The leader of the gang then, taking with him plenty of ready money, repairs, accompanied by his people, to the shop of some cloth merchant, and pretends to wish to make large purchases of cloth. This leads the merchant to open his bales; in looking over the contents of which the pretended purchaser dexterously contrives to pass down to his associates, who stand by pretending not to belong to him, one or two piece goods from each bale he inspects, which they pass on to others standing at different intervals in the bazar. In the meanwhile, the pretended merchant officiously packs up each bale, so that the real owner does not know of what may have become extracted therefrom, till two or three days subsequently he considers it necessary to count over their contents. These people travel about, in the above manner, in the Sholapore and Akulkote countries, and in the Nizam's territories and elsewhere.

22. *Teen-nāmees* are stated to be a class of Thugs of the caste of those Gosains, who mark their foreheads with *three* streaks of paint, indicating that they are the 'teen-nāmees' or *three-named* Gosains—a peculiar race of those religious mendicants who have three names. They dress scantily like the Gosains, and go about holding a cane in one hand, and an alms-dish in the other, and a bag hanging over a shoulder. They answer all inquiries by declaring to be going to Kasee (Benares) or to Ramčswur (Ceylon), or to be returning therefrom; and they will live for several months in some large town or other, observing what Sowkars are in the habit of despatching bullion, &c.; and when the 'Rokurrias'† (called in Bombay 'Angrias'), or men entrusted with the conveyance of such treasure, sally forth therewith, they follow them, and, ingratiating themselves into their confidence, often manage, like the more regular Thugs, to strangle and kill them. They dispose of the corpses in *round* holes, Thugs using *oblong* ones, which is the chief distinguishing feature between them. Over these graves they will alight for several days, cooking their food there, &c., and at length, when all signs of the earth cracking or sinking, where the interment has been made, have been carefully corrected, they depart with their booty. These people are said to travel in all directions, and to be met with everywhere; but though the Assistant General Superintendent has often met men of this tribe, such as they are or seem to be, he has not yet had any cause to believe that the men above described really now exist, whatever they may have done before; although all his approvers say that they still do occasionally murder solitary travellers as above, when a Native of any distant province, and not likely to be missed.

* Bankers and merchants are so called.

† Ready money and bullion carriers.

23. *Gand-Biggarees* are also stated to be a class of Thugs, in the garb of Gosain[‡], wearing clothes of the colour of turmeric. They go about with 'cower' baskets,* containing expressed oils, and other liquid drugs, selling the same. They travel in bodies of from ten to twenty, having 'pals' or tents when they alight anywhere. They, too, are stated to practise Thuggee, after the fashion of the Teen-nāmees, viz. those who *pretend* to be Gaud Biggarees, and vendors of physic.

24. *Mhang-Ramoosees*, like the Ramoosees, reside at villages, and serve as watchmen, for which duties they have village claims on which to subsist; but these too are gang robbers, burglars, and highwaymen, as well as very dexterous in colouring and passing off brass and other metals for gold. They belong to the Sattara, Poona, Kolapore, the Moghullai, and other countries. They have lately been found to be '*pucha Dacoits*,' and have been mentioned by the Assistant General Superintendent in his last Annual Report (for 1851).

25. *Pêr-Mhangs* are those Mhangs who, like the other village Dhêrs, reside outside of a village. They make ropes of leather and hemp, and beat tom-toms, and are Witundars, and, as such, have their official 'nemnooks' or authorised claims accordingly; but they too are robbers, &c., and are well known as such. They reside principally in the Sholapore Zilla, as well as in the Ahmednuggur, Poona, Sattara, Kolapore, and other countries.

26. *Garôdee-Mhangs* are altogether wanderers and showmen, and jugglers and conjurors; but they also are robbers, and gain information of good places to rob, by performing as above before Sowkars or other rich persons; but these do not rob on the highways, or dig into houses like the common burglars. They are to be met with everywhere, and the Bhat or Khunjur Dacoits of Hindoostan are said to have originally been a branch tribe of them.

27. *Arré-Mudgur-Mhangs*, like the Pêr-Mhanga, alight outside of villages. They are tanners, curriers, and shoemakers, and are also said to be robbers; they are to be met with in the Sholapore country, and about Punderpoor and Ahmednuggur, and in the Nizam's country.

28. *Chutturguttees* are picture painters. They have 'pôtees' or books full of all kinds of pictures and portraits, which they go about showing, and chaunting verses in explanation of the story or tradition of each, by which means they contrive to gain information of good places where to commit robberies; and which, associated with Bagrees, and often with the Deccan Kaikarees, they commit at night accordingly. They also are burglars, but never go armed on such occasions, except with a long stick or 'lathee.' Many infest the Northern Konkun.

29. *Bangrias* or *Bagrees* are also wanderers. Apparently they are fisher-

* 'Cower baskets' are baskets that are carried upon the shoulders, suspended one at each end of a bamboo.

men, and darners of woollen kumblers, and beggars; some, too, rear and sell buffaloes. They are robbers and burglars, and the oftenest associated with the Chutturguttees, in whose company, too, they are to be met with travelling about. The Bangria Dacoits of Hindoostan are not the same people. Below the Gunga river, *i. e.* in the Konkun, Sawunt Waree, and Goa countries, these Bangrias are called *Thakoors*, and are not believed to rob in those tracts.

30. *Dowree-Gosains* are a class of religious mendicants, some of whom are vagabonds, while others have fixed residences. They go about for alms in bodies, beating the while the 'dowra,' or peculiar drum they are recognised by, and are named after. They are both gang robbers and burglars. They are also called *Mënd-Yogeas*, and are to be met with everywhere.

31. *Josees*, a class of wanderers, are beggars and fortune-tellers, pretending not only to divine the future, but venturing also to say what have already been the histories of those they beguile. By such means, they gain access to the houses of respectable and wealthy persons, and plan their robberies accordingly, which they commit at night. They often associate themselves, on such occasions, with the Dowree-Gosains. They use only lathces or sticks. They are called also *Boorboorkés*, from a kind of sounding instrument upon which they play when in honest disguise.

32. *Muratha-Bunjarees* reside at villages, and serve as watchmen, and cultivate fields. Really, most are gang robbers, burglars, and horse-stealers. At day-time they are often mounted highwaymen, robbing treasure or convoys of goods, &c. They keep good horses. They mostly reside in the Nizam's territories, where they are also called *Kólies*.

33. *Tukhārees* are wanderers, travel in gangs, and are Mussulmans. Apparently they are makers of 'chekkies' or grinding-stones, and donkey rearers, but they are gang robbers and burglars. During the hot weather, some of their gangs visit the Konkun, and in the rains they keep about the neighbourhood of Ahmednuggur, the Bala Ghaut, &c. Many of these have been seized by the Department.

34. *Kolhatees* are wanderers, but some, by way of greater secrecy, reside at villages, serving as watchmen. Their women are prostitutes, but are not the same women more generally known as *Kolatnees* (the common dancing-women of the Deccan). They keep packs of dogs for hunting purposes, but they are great Dacoits, and highwaymen, but are not burglars. They infest Berar and Khandeish, and many have been arrested by the Department. They are not those of this class who are known as *Son Chirrees*, who, both men and women, are tumblers, and walk on stilts, dance on ropes, &c. The Kolhatee Dacoits are properly the *Dookhur Kolhatees*, eating *pigs*, and pretending to live by making and selling combs made of bone.

35. *Takhars* live at villages, having the appearance of being common Muratha Koonbees. Ostensibly they are menders of millstones (like the Kaikarces), night guards, and shikarees; but they are gang robbers, burglars, and rob on the roads. By going about pretending to mend chekkies, they get their information as to what houses to attack and rob. They infest the Khandeish, Berar, and Moghullai countries, and of them, too, several have been seized by the Department. They use spears, matchlocks, and swords.

36. *Bhats* are the *Khunjurs* of Goondwana, and the *Sansees* or *Sansiahs* of Hindoostan. They are the most desperate of all Dacoits, and go about in the Deccan as though belonging to the class of people known as *Guzerathee Dombarees*, or showmen. They are a very bold people, and their hour for committing a gang robbery, whether upon the house of a Sowkar or upon any Government treasury, is invariably nightfall. They have now been nearly all suppressed by the Department.

37. *Kulbhélas* travel about in the disguise of Jogeas and Gosains, selling medicines; and accompanied by their tattoos, asses, and bullocks. Their women are dressed like those of the Bhats. They too are gang robbers. They get their information by going about as vendors of medicinal drugs, and as beggars. After committing any robbery, they quickly bury their booty and disperse, and, two or three months subsequently, they contrive to recover the plunder, which then is taken to their encampment, where it is divided. To be met with in Berar and Barahuttee, &c. Their arms are spears.

38. *Purdesee-Newatees* are a class of wandering Mussulmans. They take service with Sowkars as sepoy, and after some little time a gang is assembled, and their masters robbed. They also keep horses, and are often also burglars. They infest Hindoostan, Malwa, and Guzerat.

39. *Khutboos* are a tribe of wanderers, who, of an evening, exhibit figures of men and women that are made to dance, and to act; they also catch fish. Their women are very expert at tattooing, or making representations in gunpowder on the arms, &c. of any one wishing it, as done by sailors, and they are called therefore *Putchas*. Are everywhere in the Deccan, and are called also *Kheelee-Kyunturs*. They are not robbers or thieves.

40. *Doorjee-Murjee-Wallas* are also wanderers. Both men and women go about with wooden images of idols, dressed up with ornaments made of brass. They deposit these in coloured boxes and in baskets, which are carried about by their women, or upon buffaloes, and by exhibiting which they beg money. The men carry whirrigs, which they spin round and round, and they pretend to strike their bodies with a kind of whip, and play upon tom-toms, and so beg alms. They are not robbers. Are everywhere in the Deccan.

41. *Wáid-Gólhs* are travelling quacks, dressed in turmeric-coloured clothes.

They sell drugs and medicines. Their women beg, and their children are ventriloquists. They are not robbers. *Passim*.

42. *Khur-Khur-Moondés* are also wanderers. They smear their mouths and breasts with food, as though afflicted with vomiting fits, and in that way they quickly get alms, by disgusting beholders, who are glad to get them to move off. They are not robbers. May be often met with.

43. *Gissārees* are wandering blacksmiths. They sometimes rob in the Konkun, but are not generally robbers, though some are often in the secret of gang robbers, whose spears, &c. they sometimes make up for any meditated robbery, as was done on the occasion of the dacoity by Bhât and Lumbanee Dacoits at Bagulkote, in November 1845.

44. *Dhōwurs* are travelling smelters, and make baking-pans. Are generally to be met with in the Sattara country, in the Konkun, and on the Ghauts, and wherever iron ore may be found.

45. *Dhāsrees* are wanderers. They dress themselves fantastically, and dance before people of a night; at day they beg, and are everywhere.

46. *Dombarees* are travelling showmen, and rope-dancers, both men and women, and walk on stilts. Their women are the *Son Cheerees* before mentioned (under No. 34). *Passim*.

47. *Phansee Pardhees* are the prototypes of those Pardhees who are above shown (under No. 17) to be gang robbers. They are only travelling shikarees, poor and ill clad. They snare game—peacocks, partridges, quail, antelope, &c.

48. *Zât-Gāhs* are a wandering tribe of Mussulmans. They are wrestlers and tumblers. At night they assume women's clothes, and dance before crowds.

49. *Soorga-Siddees* are travelling jugglers, and mimicks. They wear huge turbans, ornamented with peacocks' feathers, and bedaub their faces like so many clowns and pantaloons.

50. *Jogees* are pedlars and hawkers, selling pins, needles, looking-glasses, beads, &c. It is stated that some of these are occasionally Thugs. My predecessor, the late Captain Burrows, thought so, and arrested a great number of them, but without any results.

51. *Garodees* are Mussulmans, and snake-charmers. They wander about as such, with tame snakes in baskets, and generally a large rock-snake entwined about their body, or carried in their hands.

52. *Lushkurree Seekulgurs* are Mussulmans, and a class of wanderers, going about in bodies of from ten to twenty men, who encamp together outside of villages like the Kaikarees, &c. They make sheaths for swords, and sharpen and polish swords and other weapons, &c.

53. *Brinjaras* are those Lumbanees who go about with large convoys of cattle, laden with grain and other goods, in which they deal. Several, too, deal in cattle, large droves of which they bring down from the Deccan, and from Khandeish. Many of them are important Sowkars. It is their disguise that the Lumbanee Dacoits assume. They possess a very fine breed of dogs, of the large hound species.

54. *Chirree-Mars* are bird-catchers from the Coast of Madras ; properly they are Korwees ; they talk Teleegoo. They get advances of money for feathers, and then sally forth in bodies of from ten to twenty, stretching right across the peninsula, and into the Konkun, &c., catching principally kingfishers, the skins of which they take to the Madras Coast, from where they are exported to China, and there made into those fans, and other feathered ornaments that are imported to India and Europe. They are gang robbers as often as they find the opportunity to be so. They take with them supplies of *nux vomica* and other poisons, which they use as antidotes to bites from snakes in the swamps of the Konkun, where principally they find the birds abovementioned, and they seem to care little when bitten by a snake.

55. *Dukkulwars* are travelling basket-makers and beggars. They have some old established village huks from the Mhangs.

56. *Punchpôtres* are wandering beggars, getting their alms exclusively from carpenters, blacksmiths, and goldsmiths.

57. *Gopalls* travel about in parties of ten or twelve, and, like the Dombarees and Phailwans, are showmen. They are also called *Irgopalls*, and are to be frequently met. They are not robbers.

58. *Bhondé-Koomars* are also wanderers. They alight outside of villages. They make figures, in mud, of horses, elephants, &c., which they sell, also 'hooka chillums' for smoking purposes. They are not robbers.

59. *Chāruns* are traders, travelling about with large droves of pack-bullocks. They visit the Konkun, where they make their purchases, which they convey to the interior and dispose of. They also purchase, and bring down from Guzerat and Malwa, large herds of cattle, which they sell as they travel along. They are also called *Hérah's*. A great many of them reside in Kattywar. Each man is generally armed with a spear, a sword, and a buckler. They have the same appearance as the trading Brinjaras from Khandeish. Their habits as robbers have yet to be ascertained ; though they are believed to be Dacoits.

60. *Sir-Bhungees* are also wanderers, and are like the Gosains. They use human skulls from which to drink water. They are also a kind of conjurors, pretending by tricks to produce milk, liquor, fire, or such like from their mouths. In the skulls they mix up urine and 'goor,' or sugar, which they drink as a dram ; by doing which, and by squatting before houses as if to

ease nature, they extort gifts, in order to be rid of the nuisance they cause. They are believed to be also gang robbers. They are also called *Aghórees*.

61. *Nundee-Wallas* are also wanderers, and teach bullocks, &c. to do whatever they are bid; by exhibiting which they earn their livelihood. They are not robbers.

62. *Bunder-Wallas* are wanderers, and monkey showmen. There are two tribes of these people—one, a section of *Kaikarees*; and the other are *Mussulmans*.

63. *Jungle-Sonars* are journeymen smiths; they make rings and other ornaments, which they go about selling, accompanied by their donkeys.

64. *Bhowré* or *Bhoogré-Khillanéwallas* are wandering beggars. They beg by exhibiting huge spinning tops (or 'bhowras' or 'bhoogras'), during the revolutions of which they observe a profound silence, as though absorbed by the performances.

65. *Párots* go about with models, in wood, of temples of various kinds, which at night they illuminate with lamps and torches, and play music, and sound conches in front of them, and so collect money and subsist; their women beg by day. They alight outside of villages.

66. *Yergólhs* go about selling frankincense, sandalwood, kokum, &c. These are different from the *Yergólhs* mentioned under No. 2, though these too are more commonly to be met with in the Madras country, in the neighbourhood of Seringapatam. But they are constantly to be seen in Bombay also—a few are generally daily seated in the Fort within the Bazar Gate, with their drugs, roots of trees, human bones, dried locusts and lizards, and other specifics for every known ailment, lying scattered round about them.

67. *Mool-Dhásurs* wear large pügrees, and go about collecting money by standing bare-footed upon thorns, and by pricking and wounding their bodies with divers instruments. During such performances, they keep up a kind of music, by blowing through shells, and tapping a kind of gong.

68. *Khunjurs* are a race of men who are rope-spinners, and make foot-mats of coir—a very useful people; while another tribe so called rear and sell tattoos, and steal them too. The Sansiah Dacoits, where thought to be *Khunjurs*, pretend to be the latter people.

69. *Chowras* are a tribe of *Bhamptés*, very expert in robbing people while on horseback, in fairs, 'juthras,' and crowded places. They disdain to attempt to steal everything they can get, as the *Bhamptés* do, and will only be tempted by what is valuable, and to rob respectable persons, with which view they themselves dress respectably. There is a colony of them at Jamkher, near Ahmednuggur.

70. *Hurdass* are connected with the *Chutturguttees*. Some *Hurdasses*

form a part of the establishment of a Muratha family, and are its story-tellers, reading and chaunting 'kuthas' or pleasant tales, for the amusement of its members. It is said of the great Sivajee, that he was always very fond of attending the assemblies of these kutha readers. It is a favourite Muratha pastime; and the advent of a Huridass in a village is hailed with much pleasure, and he is listened to by a large audience, till often quite a late hour. They are not robbers, but go about in small parties.

71. *Phailwans* are a tribe of wandering Mussulmans. They exhibit as wrestlers and gladiators, and are very athletic, performing remarkable feats in gymnastics, sword exercise, &c. Many of them are also very expert at all kinds of tricks and displays of legerdemain. Their children are very intelligent and agile. These men are honest.

(Signed) C. HERVEY, Captain,
Assistant General Superintendent.

*Assistant General Superintendent's Office,
Belgaum, 26th May 1852.*

**SELECTIONS FROM THE RECORDS OF THE BOMBAY
GOVERNMENT.**

IRRIGATION SERIES.—No. II, Vol. II.

WATER SUPPLY
OF
POONA AND KIRKEE
WITH
PLANS AND ESTIMATES.

VOL. II.

PROJECT
BY
LIEUT. COL. FIFE, R.E.

WITH 5 PLANS.

Bombay:

PRINTED FOR GOVERNMENT
AT THE EDUCATION SOCIETY'S PRESS, BYCULLA.

1866.

MEMORANDUM.

THE following papers regarding the Dam to be erected at Kurrukwasla to form the Reservoir for the Poona Water Supply, refer chiefly to the question of strength as designed by the projector (Lieutenant-Colonel Fife), and also the desirability of increasing the size of it to extend the scheme by irrigating the Indapoor Valley, in addition to the original project of supplying Poona, Kirkec, and Gunnesh Khind with water, and for irrigating 4,000 acres of land between Kurrukwasla and Poona.

4th September 1866.

T. DOWDEN.

No. 5904 of 1866.

PUBLIC WORKS DEPARTMENT :

*Office of the Superintending Engineer S.D.,
Poona, 7th August 1866.*

To the SECRETARY TO GOVERNMENT,
Public Works Department, Bombay.

SIR,—I have the honour to forward the accompanying Plan and Estimate received from the Superintending Engineer for Irrigation, for constructing a Dam 88 feet high across the Moola River at Kurrukwasla, and sufficiently thick to admit of its height being hereafter increased so as to supply water for irrigating the Indapoor valley, as well as for the cantonments of Poona and Kirkee, &c.

2. In submitting Lieutenant-Colonel Fife's project, which provides for supplying the Poona and Kirkee Cantonments, the new Arsenal, and Powder Works, and the city of Poona with its environs, only, with water, I remarked, as stated by Lieutenant-Colonel Playfair, on the lightness of Lieutenant-Colonel Fife's section for the Dam, and proposed to increase slightly its dimensions. What action was taken by Government on that proposal I know not, but as my name is in a measure associated with the project, from the fact of my having been called upon to report on it, I respectfully beg that the observations I then made in regard to the dimensions of the dam may, as they cannot now be attached to the report, be circulated among those officers to whom the project has been sent.*

* "2. Lieut.-Colonel Fife's project is in every respect complete, so far as it extends, and his report is so ably written that I feel I should fail to afford further information on the subject were I to attempt to do so. The preliminary investigations, moreover, necessary for the preparation of the designs, have been conducted with so much care, both by Colonel Fife and his assistants, that it is with the greatest diffidence I venture even to remark that Lieutenant-Colonel Fife has perhaps rather over-

3. It will be seen from Lieut.-Colonel Playfair's report that he proposes to build the Dam of a greater width than what has been yet recommended. The formula on which his calculations

estimated the strength of the main work (the Dam across the river) and under-rated the cost of portions of the work to be executed in carrying out the scheme.

"3. As regards the strength of the proposed Dam we have no work of similar magnitude from which the requisite dimensions could be decided, and we are therefore obliged to resort to formulæ furnished by different authors. Rankine says that the thickness of a Masonry Dam at bottom should equal six-tenths of the height, and at the top one-fourth of the bottom, and by Moseley's formula the line of least resistance is required to fall 3.75 feet within the point shown on Colonel Fife's section, or in other words the dam at bottom should be within 6" of the width proposed by Rankine. Now the following are the dimensions of Colonel Fife's Dam, and of dams of similar construction as deduced from Rankine's and Moseley's formula :—

	Thickness of Dam at bottom.	Thickness of Dam at top.	
Colonel Fife's calculations ..	46.75	11.6875	$\left\{ \begin{array}{l} \text{When the weight of} \\ \text{a cubic foot of} \\ \text{masonry} = 150 \text{ lbs.} \end{array} \right.$
Rankine's	51.00	12.75	
Moseley's	50.50	12.25	$\left\{ \begin{array}{l} \text{When the weight of} \\ \text{a cubic foot of} \\ \text{masonry is 140, as} \\ \text{obtained from their} \\ \text{tables.} \end{array} \right.$

And the dimensions of Colonel Fife's Dam would be increased as shown were the weight of a cubic foot of masonry reduced to 140 lbs.	$\left\{ \begin{array}{l} 49.5 \\ 12.375 \end{array} \right.$
---	---

"4. I am not prepared to say that the Dam as proposed by Lieut.-Colonel Fife is not quite strong enough to resist the pressure of water, and I should not venture to call Lieut.-Colonel Fife's calculations into question, were it not that the fact of the project passing through my hands makes me in a measure responsible for its accuracy.

"5. Considering that the weight of a cubic foot of masonry was found by experiment on a small scale to be from 143 to 148 lbs. it would have been more expedient to have supposed that in a large mass its weight would have diminished rather than increased, and that 140 instead of 150 lbs. would have been the better basis to rest the calculations upon.

"6. I fear from the accompanying statement, showing the rates for the different descriptions of work required in carrying out the project as compared with those which are in use in the offices of the Executive Engineers Poona and Kirkee, and the Poona District, that Colonel Fife's estimates are, as before stated, under-rated, and that the cost of the undertaking will exceed the amount he asks for. As, however, the early submission of the estimate is desired, and Lieut.-Colonel Fife could not be

are based is taken from the *Aide Memoire*, but it does not accord with that given by Moseley and Rankine, both of whose works were published at a much more recent date.

4. The table appended exhibits the difference of opinion entertained on the subject by the authors above named. The question therefore must still be looked upon as one open to discussion, and considering the immense amount of injury failure would occasion, not only to private property, but also to bridges and other

communicated with, without causing great delay, I do not consider I should be acting in accordance with the wishes of Government were I to delay the transmission of the project in order to call for further explanation on this head.

"I have, &c,

"C. SCOTT, Lieut.-Colonel, R.E.,

Superintending Engineer S. D.

"COMPARATIVE STATEMENT of usual Rates throughout the Poona District at which the works are being carried out.

Description of work.	Colonel Lyle's Rates.	Executive Engineer Poona and Kirkree's Rates.		Executive Engineer Poona District's Rates.								
		Rs.	a. p.	Rs.	a. p.	Rs.	a. p.					
Excavation in earth 100 C. F.	0	8	0	0	12	0	0	12	0	1	0	0
Do. in moorum do.	1	0	0	1	8	0	1	8	0	2	0	0
Do. in rock do.	4	0	0	7	0	0	4	0	0	7	0	0
Filling in foundation, uncoursed rubble masonry. do.	16	0	0	15	0	0	14	0	0	15	0	0
Superstructure, of coursed rubble masonry, of piers and abut- ments do.	20	0	0	30	0	0	22	0	0	30	0	0
Spandril wall, of coursed rubble.. do.	20	0	0	30	0	0	25	0	0	35	0	0
Archwork do. including facing voussoirs do.	{	40	to									
		50	0	0	50	0	0	35	0	0	40	0	0
Parapet wall, of coursed rubble masonry do.	35	0	0	50	0	0	40	0	0	50	0	0
Plastering, of chunam. 100 S. F.	5	0	0	8	0	0	8	0	0	9	0	0
Pavement, cut stone 2nd sort do.	50	0	0	50	0	0	40	0	0	45	0	0
Embankment of earth and moorum. 100 C. F.	0	12	0	1	0	0	1	0	0	1	4	0

public buildings, too much attention cannot be paid to the subject, before deciding finally on the section to be adopted.

5. It would be doubtless very desirable, if cost were no object, to construct the Dam of the proportions proposed in the *Aide Memoire*, in order to secure it against any possibility of failure, but I submit that this could scarcely be considered a sufficient reason for incurring so large an expenditure beyond what would be required to execute the work in accordance with the formula given by Rankine and Moseley, unless that formula, which is based on the ascertained weight of a cubic foot of masonry, and the known specific gravity of a cubic foot of water, can be satisfactorily proved to be incorrect. *Vide* page 246 of Rankine's *Applied Mechanics*, and page 442 *Moseley's Mechanical Principles of Engineering and Architecture*.

6. I have ventured on the above remarks as His Excellency is said to have stated that the large project will be *sooner* or *later* carried out. If it is decided to construct the smaller Dam first, I trust that the expediency of increasing the dimensions of the section proposed by Lieut.-Colonel Fife will be again considered before the work is commenced.

I have the honour to be,

Sir,

Your most obedient Servant,

C. SCOTT, Lieut.-Colonel, R.E.,
Superintending Engineer S. D.

**STATEMENT showing the thickness of the Dam proposed to be erected at Kurrukasla, according to different authorities,
if 123 or 88 feet in height.**

DESCRIPTION OF WORKS.	From Aid Memoirs, as calculated by Colonel Playfair.			According to Mosley and Rankine.			According to Colonel Fife's calculations.			REMARKS.
	Top thickness in feet.	Bottom thickness in feet.	Mean thickness in feet.	Top thickness in feet.	Bottom thickness in feet.	Mean thickness in feet.	Top thickness in feet.	Bottom thickness in feet.	Mean thickness in feet.	
Dimensions of larger Dam	36-00	84-00	60-00	18-00	72-00	45-00	16-50	66-00	41-25	* The probable amounts here given are those which would be required for expenditure if the Dam were built only to the height proposed for the smaller Dam. *
Probable cost	* Rs. 20,11,984			* Rs. 15,08,957			* Rs. 13,83,035			
Distance of the point of intersection of the line of resistance with the base from the interior toe of the Dam	51-42 feet.			50-87 feet.			50-41 feet.			
Dimensions of smaller Dam	25-50	59-50	42-50	12-75	51-00	31-87	11-68	46-75	29-21	
Probable cost	Rs. 10,95,383			Rs. 7,59,563			Rs. 7,52,710			
Distance of the point of intersection of the line of resistance with the base from the interior toe of the Dam	26-62 feet.			36-95 feet.			37-51 feet.			

N.B.—The difference in the results obtained from the formulæ given by Mosley and Rankine is inappreciable, indeed the formulæ are similar, except that in one instance the inner side of the Dam is supposed to be vertical, in the other a batter is given to it, as proposed by Colonel Fife.

C. SCOTT, Lieutenant Colonel, R.E.,
Superintending Engineer S. D.

No. 927 of 1866.

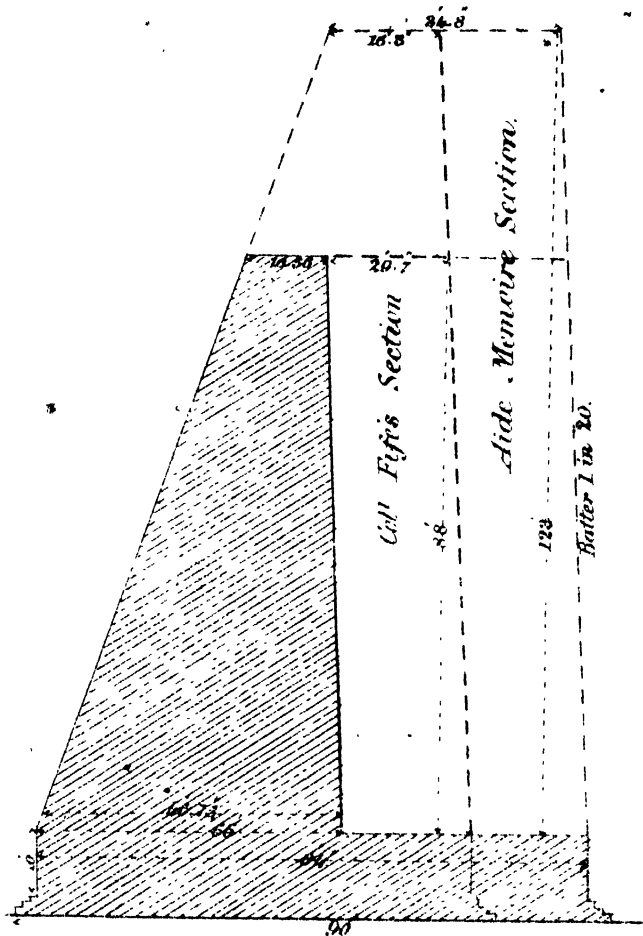
PUBLIC WORKS DEPARTMENT :

OFFICE OF SUPERINTENDING ENGINEER FOR IRRIGATION,
Poona, 30th July 1866.

To The SUPERINTENDING ENGINEER,
 Southern Division, Poona.

SIR,—In an interview with His Excellency the Governor on the 7th instant, the subject of the Poona Water Supply Project, and its subsequent extension for irrigation, came under discussion.

2. You are aware that the water supply is to be obtained from a lake on the Moota river, to be formed by throwing a Dam 88 feet in height across the valley some miles above Poona, and of a thickness calculated for that height only. Whilst preparing his project for the water supply, it occurred to Colonel Fife that with an additional height of Dam and consequent additional storage, a very valuable Irrigation Canal could be supplied to water the valley on the right bank of the Moota and Bheema rivers ; the water supply was, however, urgent ; the plans for the irrigation extension would take a long time to prepare, and he therefore sent in the former project complete in itself, merely alluding to the irrigational scheme in a paragraph (No. 36) of his printed report, and recommending that, when carried out, the *foundations* of the water supply Dam should be so increased in dimensions as to answer for the larger Dam, if ever sanctioned ; but the extra masonry above the foundations for the larger Dam was to have been added on hereafter to that already supposed to be built, thus : —



The shaded portion representing the masonry required for the Poona Water Supply, with the extra foundation added ; the dotted lines showing the extension for the Irrigational scheme.

I may add that though I have in the sketch shown the extra foundation carried out at the same time as the water supply Dam, no provision for its cost is made in the estimate. Colonel Fife merely mentioned it in the paragraph (No. 36) I have quoted, as likely to cost Rs. 1,09,368.

3. On this point His Excellency remarked somewhat to the following effect :—“ That there was no doubt a very valuable supply

for Irrigation could be stored up, and that the Irrigation scheme would in consequence certainly be carried out sooner or later, and that it would surely be better to make the Dam for the water supply of such dimensions at once as to admit of its being extended by simply increasing its height, rather than hereafter to be obliged to increase its dimensions from the base upwards by adding old work to new, and incurring the risk of unequal settlement and the want of proper bond between the two portions."

4. Of the advantage of making the Dam of the full thickness required for the Irrigation project at once, merely leaving it to be raised when that project is to be carried out, there can be, I think, but one opinion. I myself most fully concurred, and was then directed to submit an estimate of the probable extra cost of the work, which I have the honour to do herewith. Colonel Fife adopted a very light section for his Poona Water Supply Dam, and intended, I presume, to adopt the same formula when he added to it for the Irrigational one. I have shown his section by a blue line on section No. 19. I myself think that for such a vast work, the usual practical rule should be adopted, and have drawn the sections accordingly; it is very probable that a still greater increase of height may hereafter be found necessary; this could be done perhaps to a moderate extent with the large section when the work was consolidated; it would be very hazardous to do it with Colonel Fife's.

5. The extra cost required to make the Dam of full thickness at once, but only up to Poona water supply height, then, is on Colonel Fife's formula, thus:—

	Rs.
Now estimated	16,61,391
Originally estimated	9,63,432
Extra cost	<u>6,97,959</u>
On the usual practical rule:—	
Now estimated	22,23,645
Originally estimated	<u>9,63,432</u>
Extra cost	<u>12,60,213</u>

6. The practical rule I have adopted is given in the *Aide Memoire*, article River and Inland Navigation, page 275, where X being the thickness sought in terms of the height: at the top $X = \cdot 30$; in the middle $X = \cdot 50$; and at the bottom $X = \cdot 70$; and the following remark is taken from the same work:—“Such thicknesses are perhaps rather in excess, but the terrible consequences arising from the bursting of a Dam, and the more perfect impermeability of a large mass of masonry should rather induce a preference in this direction.” The lightness of Colonel Fife’s section struck you, and you remarked upon it in your No. 8173 of the 21st December 1865, when you forwarded the Water Supply Project on; and with regard to the *Aide Memoire’s* remarks, I have only to add that we are going to build—

(1) A Dam above the populous City of Poona, which will be flooded, and probably partially destroyed, should an accident happen to it.

(2) That the height and length of the work is greater than anything known in Europe.

(3) That it is the first work of the kind ever executed in this part of the country, and any accident happening to it would prevent others, so much wanted, being built.

(4) And that therefore it is better to take practical rules deduced from *smaller works* already built, than adopt theoretical ones giving much lighter dimensions to *larger works* than have ever as yet been undertaken.

7. In either estimate the sums are large, and the point on which its sanction will hinge will be whether the profit to be derived from the Irrigation scheme to be eventually carried out will warrant this preliminary expenditure, and there is a fear lest the Supreme Government may hesitate to sanction it, pending the submission of the Irrigational project in a complete form. But the same reason that leads us to press for the sanction of the water supply in the first instance should have weight with the Supreme Government also; this reason being the urgent want of water for the Cantonment and City of Poona, for the Cantonment of Kirkee, and the

new Powder Works, which latter cannot be started till water is available.

8. The Irrigational project is in preparation, and will be sent in as soon as it can be matured, but it involves many difficult questions, and much drawing, calculating, and estimating. The data upon which it is founded are as follows :—

(1) That the lake will fill every year with much less than a minimum flow in the river.

(2) That its contents above the sill of the outlet sluice will, when the Dam is raised to the full height of 123 feet, be—

	C. F. 8,098,375,000
<i>Deduct</i> —6 feet perpendicular for evaporation	1,052,400,000
Balance	7,045,975,000
<i>Add</i> —amount derived from dry weather stream in river	993,600,000
	<u>8,039,575,000</u>

Divide this over a space of 7 months, then the perennial discharge will be $\frac{8,039,575,000}{7 \times 30 \times 24 \times 60 \times 60} = 443$ c. f. per second

From this to be deducted for Poona and Kirkee

Water Supply 31 „ „

Leaving 412 „ „

available for Irrigation for the whole of the dry weather ; to this must be added a very considerable monsoon discharge over and above the amount required to fill the Tank, which will be invaluable to the Poona valley, so often liable to drought and famine.

9. The estimate and accompanying sections are very complete, and do not require any further comment. I have myself calculated the position of the line of resistance for the Dam at its extreme height, which calculations are appended to the estimate.

I have the honor to be,

Sir,

Your most obedient Servant,

J. W. PLAYFAIR, Lieut. Colonel, R.E.,
Superintending Engineer for Irrigation.

ESTIMATE No. 2 of 1866-67.

Poona and Kirkee Water Supply.

PUBLIC WORKS DEPARTMENT :

Office of the Assistant Engineer for Irrigation.

ESTIMATE framed by Lieutenant BUCKLE, R.E., Assistant Engineer for Irrigation, Poona, of the Probable Cost of constructing the Bund across the River Moota at Kurrukwasla (vide Estimate No. 2 of 1865-66), to the level required for the Poona Water Supply Project, but of dimensions sufficient to answer without alteration, for the larger Irrigation Project.

IRRIGATION DAM (120 feet).*

Estimate framed agreeably to instructions received from the Superintending Engineer for Irrigation on the 7th July 1866.

Amount of Estimate, Rs. 22,23,645-12-9.

DESCRIPTION.

The length of the Bund and Waste Weir will be the same as that previously estimated, viz. bund 2,938 feet, waste weir 1,658 feet. The dimensions of the Dam throughout are such that the top thickness is equal to three-tenths, the bottom thickness seven-tenths, and the mean thickness one-half the height. The waste weir has a mean thickness of half the height, and is perpendicular on the down stream side with a rear batter of one-sixth.

The addition of the large Dam, though it will not alter the length, will alter the position, of the waste weir, which will always be kept at the extremity of the north end of the Dam. It will alter the point of commencement of the waste weir by 605 feet, i. e. a length of 605 feet, which in the small Dam will act as a portion

* The Water Supply Dam is 88 feet.

of the waste weir; will afterwards form a portion of the large Dam itself, the additional height making up this length of the weir at its other extremity. This length therefore, or from the 34th to the 37th sections, is calculated as a part of the Dam, though, until the large project is carried out, it will have to act as waste weir.

No other alterations have been made on the original design. The wingwall and the Dam parapet remain as before. Their dimensions, and all details of construction, are given fully in the General Description and Specification of the Dam.

MEASUREMENTS.

<i>Excavation for foundation in Rock.</i>	Numbers.	Length.	Breadth.	Depth.	SOLID FEET.
From 0 to No. 1	1	42	32	1	1,344·00
No. 1 to No. 2	1	24	33·19	1	796·56
No. 2 to No. 3	1	12	35·97	1	431·64
No. 3 to No. 4	1	28	3·72	1	1,084·16
No. 4 to No. 5	1	28	37·94	2	2,124·64
No. 5 to No. 6	1	91	41·90	2	7,625·80
No. 6 to No. 7	1	235	49·82	2·5	29,269·25
No. 7 to No. 8	1	28	56·60	3	4,754·40
No. 8 to No. 9	1	118	60·34	3·5	24,920·42
No. 9 to No. 10	1	14	63·64	4·0	3,563·84
No. 17 to No. 18	1	91	84·55	4·0	30,776·20
No. 18 to No. 19	1	134	90·52	4·0	48,518·72
No. 19 to No. 20	1	26	90·71	4·0	9,433·84
No. 20 to No. 21	1	254	86·4	3·5	76,809·60
No. 21 to No. 22	1	15	80·93	3·0	3,641·85
No. 22 to No. 23	1	23	78·04	3·0	6,384·76
No. 23 to No. 24	1	84	75·39	3·0	18,992·28
No. 24 to No. 25	1	19	71·42	3·0	4,070·94
No. 25 to No. 26	1	90	69·71	3·0	18,821·70
No. 26 to No. 27	1	72	71·83	3·0	15,418·08
No. 27 to No. 28	1	17	70·95	3·0	3,618·45
No. 28 to No. 29	1	133	65·37	3·0	26,082·63
No. 29 to No. 30	1	218	61·56	3·0	40,260·24
No. 30 to No. 31	1	80	60·62	3·0	14,548·80
Carried over....	..	..	..	..	393,588·80

*Excavation for Foundation in
Rock—(continued).*

	Number.	Length.	Breadth.	Depth.	SOLID FEET.
Brought over....	..	..	..	..	393,589.80
From 31 to No. 32	1	239	58.23	3.0	41,786.76
No. 32 to No. 33	1	13	55.57	3.0	2,167.23
No. 33 to No. 34	1	174	53.54	3.0	27,947.88
No. 34 to No. 35	1	160	53.56	3.0	25,703.80
No. 35 to No. 36	1	370	48.9	2.5	45,223.25
No. 36 to No. 37	1	75	41.29	2.0	6,643.50
Total solid feet Excavation in Rock....					543,066.22

*Excavation for Foundation in
Earth.*

From 0 to No. 1	1	42	32	1.0	1,344.00
No. 1 to No. 2	1	24	33.19	1.0	796.56
No. 2 to No. 3	1	12	35.97	1.0	431.64
No. 3 to No. 4	1	28	38.72	1.0	1,084.16
No. 8 to No. 9	1	118	60.34	5.0	3,560.06
No. 9 to No. 10	1	14	63.64	9.25	82,41.38
No. 10 to No. 11	1	143	66.21	15.75	149,121.47
No. 11 to No. 12	1	20	69.02	19.00	26,227.60
No. 12 to No. 13	1	216	72.16	19.00	296,144.64
No. 13 to No. 14	1	13.00	74.35	19.00	18,364.45
No. 14 to No. 15	1	11	72.05	19.00	15,058.45
No. 15 to No. 16	1	223	72.78	19.00	303,368.86
No. 16 to No. 17	1	13	78.21	16.50	16,776.04
No. 17 to No. 18	1	91	84.55	5.00	33,40.25
No. 19 to No. 20	1	26	90.71	2.00	4,716.92
No. 20 to No. 21	1	254	86.4	4.5	98,755.20
No. 21 to No. 22	1	15	80.83	7.5	9,04.62
No. 22 to No. 23	1	23	78.04	10.0	17,949.20
Carried over....	..	..	..	..	1,014,515.50

Excavation for Foundation in Earth
(continued).

	Number	Length.	Breadth.	Depth.	SOLID FEET.
Brought over.....	..	..	..	..	1,014,515.50
From 23 to No. 24	1	84	75.39	11.0	69,660.36
No. 24 to No. 25	1	19	71.42	13.5	18,319.23
No. 25 to No. 26	1	90	69.71	13.0	80,975.70
No. 26 to No. 27	1	72	71.33	6.5	33,405.84
No. 27 to No. 28	1	17	70.95	4.0	4,824.60
No. 28 to No. 29	1	133	65.37	6.0	52,165.26
No. 29 to No. 30	1	218	61.56	3.0	40,260.24
No. 30 to No. 31	1	80	60.62	1.25	6,062.00
No. 31 to No. 32	1	239	53.28	2.25	31,340.07
No. 32 to No. 33	1	13	55.57	3.25	2,347.83
No. 33 to No. 34	1	174	53.54	3.25	30,276.87
No. 34 to No. 35	1	160	52.56	2.50	21,424.00
No. 35 to No. 36	1	370	48.89	3.00	54,267.90
No. 36 to No. 37	1	75	44.29	3.50	11,626.12
Total solid feet Excavation in Earth... ..					1,471,471.52

*Filling in Foundation with uncoursed
Rubble Stone and Chumam.*

From 0 to No. 1, 1st step	1	42	32	1	1,344.00
Ditto 2nd step	1	41	30	1	1,230.00
No. 1 to No. 2, 1st step	1	24	33.19	1	796.56
Ditto 2nd step	1	24	31.19	1	748.56
No. 2 to No. 3, 1st step	1	12	35.97	1	431.64
Ditto 2nd step	1	12	33.97	1	407.64
No. 3 to No. 4, 1st step	1	23	33.72	1	1,034.16
Ditto 2nd step	1	23	36.72	1	1,028.16
No. 4 to No. 5, 1st step	1	23	37.94	1	1,062.82
Ditto 2nd step	1	23	35.94	1	1,006.32
No. 5 to No. 6, 1st step	1	91	41.90	1	3,812.90
Ditto 2nd step	1	91	39.90	1	3,630.90
No. 6 to No. 7, 1st step	1	235	49.82	1.5	17,561.55
Ditto 2nd step	1	235	46.82	1.0	11,002.70
Carried over.....	..	..	..	..	45,147.41

*Filling in Foundation with uncoursed
Rubble Stone and Chumam—
(continued).*

	Number.	Length.	Breadth.	Depth.	SOLID FEET.
Brought over....	..	..	..	..	45,147.11
From 7 to No. 8, 1st step	1	28	56.60	1.0	1,584.80
Ditto 2nd step	1	28	54.60	1.0	1,523.80
Ditto 3rd step	1	23	52.60	1.0	1,472.80
No. 8 to No. 9, 1st step	1	118	60.34	1.5	10,620.18
Ditto 2nd step	1	118	57.34	1.0	6,766.12
Ditto 3rd step	1	118	55.34	1.0	6,530.12
Ditto 4th step	1	118	53.34	5.0	31,470.60
No. 9 to No. 10, 1st step	1	14	63.64	1.0	8.0.96
Ditto 2nd step	1	14	61.64	1.0	862.96
Ditto 3rd step	1	14	59.64	1.0	834.96
Ditto 4th step	1	14	57.64	1.0	806.96
Ditto 5th step	1	14	55.64	9.25	7,205.38
No. 10 to No. 11, 1st step	1	143	66.21	1.0	9,462.03
Ditto 2nd step	1	143	64.21	1.0	9,112.03
Ditto 3rd step	1	143	62.21	1.0	8,896.03
Ditto 4th step	1	143	60.21	1.0	8,610.03
Ditto 5th step	1	143	58.21	11.75	97,107.35
No. 11 to No. 12, 1st step	1	20	69.02	1.0	1,320.40
Ditto 2nd step	1	20	67.02	1.0	1,340.40
Ditto 3rd step	1	20	65.02	1.0	1,300.40
Ditto 4th step	1	20	63.02	1.0	1,260.40
Ditto 5th step	1	20	61.02	15.0	18,306.00
No. 12 to No. 13, 1st step	1	216	72.16	1.0	15,516.56
Ditto 2nd step	1	216	70.16	1.0	15,154.56
Ditto 3rd step	1	216	68.16	1.0	14,722.56
Ditto 4th step	1	216	66.16	1.0	14,290.56
Ditto 5th step	1	216	64.16	15.0	207,878.40
No. 13 to No. 14, 1st step	1	13	74.35	1.0	966.56
Ditto 2nd step	1	13	72.35	1.0	940.55
Ditto 3rd step	1	13	70.35	1.0	914.55
Ditto 4th step ..	1	13	68.35	1.0	888.55
Ditto 5th step	1	13	66.35	15.0	12,938.25
No. 14 to No. 15, 1st step	1	11	72.05	1.0	792.55
Ditto 2nd step	1	11	70.05	1.0	770.55
Ditto 3rd step	1	11	68.05	1.0	749.55
Ditto 4th step	1	11	66.05	1.0	726.55
Ditto 5th step	1	11	64.05	15.0	10,568.25
* Carried over ...	..	..	..	..	571,210.67

Filling in Foundation with uncoursed Rubble Stone and Chunan—
(continued).

	Number.	Length.	Breadth.	Depth.	SQ. FEET.
Brought over.....	..	..	..	..	571,210.67
From 15 to No. 16, 1st step	1	223	72.78	1.0	16,229.94
Ditto 2nd step	1	223	70.78	1.0	15,783.94
Ditto 3rd step	1	223	68.78	1.0	15,337.94
Ditto 4th step	1	223	66.78	1.0	14,891.94
Ditto 5th step	1	223	64.78	15.0	210,039.10
No. 16 to No. 17, 1st step	1	13	78.21	1.0	1,016.73
Ditto 2nd step	1	13	76.21	1.0	990.73
Ditto 3rd step	1	13	74.21	1.0	964.73
Ditto 4th step	1	13	72.21	1.0	938.73
Ditto 5th step	1	13	70.21	12.5	11,409.12
No. 17 to No. 18, 1st step	1	91	84.55	1.0	7,694.05
Ditto 2nd step	1	91	82.55	1.0	7,512.05
Ditto 3rd step	1	91	80.55	1.0	7,330.05
Ditto 4th step	1	91	78.55	1.0	7,148.05
Ditto 5th step	1	91	76.55	5.0	34,830.25
No. 18 to No. 19, 1st step	1	134	90.52	1.0	12,129.68
Ditto 2nd step	1	134	88.52	1.0	11,861.68
Ditto 3rd step	1	134	86.52	1.0	11,593.68
Ditto 4th step	1	134	84.52	1.0	11,325.68
No. 19 to No. 20, 1st step	1	26	90.71	1.0	2,358.46
Ditto 2nd step	1	26	88.71	1.0	2,306.46
Ditto 3rd step	1	26	86.71	1.0	2,254.46
Ditto 4th step	1	26	84.71	1.0	2,202.46
Ditto 5th step	1	26	82.71	2.0	4,300.92
No. 20 to No. 21, 1st step	1	254	86.4	1.5	34,418.40
Ditto 2nd step	1	254	83.4	1.0	21,193.60
Ditto 3rd step	1	254	81.4	1.0	20,675.60
Ditto 4th step	1	254	79.4	4.5	90,754.20
No. 21 to No. 22, 1st step	1	15	80.93	1.0	1,218.95
Ditto 2nd step	1	15	78.93	1.0	1,183.95
Ditto 3rd step	1	15	76.93	1.0	1,153.95
Ditto 4th step	1	15	74.93	7.5	8,429.62
No. 22 to No. 23, 1st step	1	23	78.04	1.0	1,794.92
Ditto 2nd step	1	23	76.04	1.0	1,748.92
Ditto 3rd step	1	23	74.04	1.0	1,702.92
Ditto 4th step	1	23	72.04	10.0	16,569.20
No. 23 to No. 24, 1st step	1	84	75.39	1.0	6,332.76
Ditto 2nd step	1	84	73.39	1.0	6,164.76
Ditto 3rd step	1	84	71.39	1.0	5,996.76
Ditto 4th step	1	84	69.39	11.0	64,116.36
Carried over.....	..	..	..	..	1,267,160.27

*Filling in Foundation with uncoursed
Rubble Stone and Chumam—
(continued).*

	Numbers.	Length.	Breadth.	Depth.	SOLID FEET.
Brought over....	..	..	..	..	1,267,160.27
From 24 to No. 25, 1st step	1	19	71.42	1.0	1,356.98
Ditto 2nd step	1	19	69.42	1.0	1,318.98
Ditto 3rd step	1	19	67.42	1.0	1,280.98
Ditto 4th step	1	19	65.42	13.5	16,780.23
No. 25 to No. 26, 1st step ...	1	90	69.71	1.0	6,273.90
Ditto 2nd step	1	90	67.71	1.0	6,093.90
Ditto 3rd step	1	90	65.71	1.0	5,913.90
Ditto 4th step	1	90	63.71	13.0	84,540.70
No. 26 to No. 27, 1st step	1	72	71.38	1.0	5,139.36
Ditto 2nd step	1	72	69.38	1.0	4,995.36
Ditto 3rd step	1	72	67.38	1.0	4,851.36
Ditto 4th step	1	72	65.38	6.5	30,597.84
No. 27 to No. 28, 1st step	1	17	70.95	1.0	1,206.15
Ditto 2nd step	1	17	68.95	1.0	1,172.15
Ditto 3rd step	1	17	66.95	1.0	1,138.15
Ditto 4th step	1	17	64.95	4.0	4,416.60
No. 28 to No. 29, 1st step	1	133	65.37	1.0	8,694.21
Ditto 2nd step	1	133	63.37	1.0	8,423.21
Ditto 3rd step	1	133	61.37	1.0	8,162.21
Ditto 4th step	1	133	59.37	6.0	47,377.26
No. 29 to No. 30, 1st step	1	218	61.56	1.0	13,420.03
Ditto 2nd step	1	218	59.56	1.0	12,984.03
Ditto 3rd step	1	218	57.56	1.0	12,548.03
Ditto 4th step	1	218	55.56	3.0	36,336.24
No. 30 to No. 31, 1st step	1	80	60.62	1.0	4,849.60
Ditto 2nd step	1	80	58.62	1.0	4,689.60
Ditto 3rd step	1	80	56.62	1.0	4,529.60
Ditto 4th step	1	80	54.62	1.25	5,462.00
No. 31 to No. 32, 1st step	1	239	58.23	1.0	13,928.92
Ditto 2nd step	1	239	56.23	1.0	13,450.92
Ditto 3rd step	1	239	54.23	1.0	12,972.92
Ditto 4th step	1	239	52.28	2.25	28,113.57
No. 32 to No. 33, 1st step	1	13	55.57	1.0	722.41
Ditto 2nd step	1	13	53.57	1.0	696.41
Ditto 3rd step	1	13	51.57	1.0	670.41
Ditto 4th step	1	13	49.57	3.25	2,094.33
No. 33 to No. 34, 1st step	1	174	53.54	1.0	9,315.96
Ditto 2nd step	1	174	51.54	1.0	8,967.96
Ditto 3rd step	1	174	49.54	1.0	8,619.96
Ditto 4th step	1	174	47.54	3.25	26,883.87
Carried over....	..	..	..	..	1,738,155.62

*Filling in Foundation with uncoursed
Rubble Stone and Chunam—
(continued).*

	Number.	Length.	Breadth.	Depth.	SOLID FEET.
Brought forward ....	..	..	..	..	1,738,155.62
From 34 to No. 35, 1st step	1	160	53.56	1.0	8,569.60
Ditto 2nd step	1	160	51.56	1.0	8,249.60
Ditto 3rd step	1	160	49.56	1.0	7,929.60
No. 35 to No. 36, 1st step	1	370	48.9	1.5	27,133.95
Ditto 2nd step	1	370	45.89	1.0	16,979.30
No. 36 to No. 37, 1st step	1	75	44.29	1.0	3,321.75
Ditto 2nd step	1	75	42.29	1.0	3,171.75
Total solid feet filling in Foundation....					1,813,511.17

*Superstructure of coursed Rubble
Masonry and Chunam.*

	Number.	Length.	Mean Area.	SOLID FEET.
From 0 to No. 1	1	40	105.60	4,224.00
No. 1 to No. 2	1	24	265.77	6,378.48
No. 2 to No. 3	1	12	202.37	2,423.44
No. 3 to No. 4	1	23	466.00	13,048.00
No. 4 to No. 5	1	23	506.40	14,179.20
No. 5 to No. 6	1	91	750.03	68,257.23
No. 6 to No. 7	1	235	1,247.27	293,103.45
No. 7 to No. 8	1	28	1,717.65	48,094.20
No. 8 to No. 9	1	118	1,968.65	232,300.70
No. 9 to No. 10	1	14	2,193.67	30,711.33
No. 10 to No. 11	1	143	2,456.10	351,222.30
No. 11 to No. 12	1	20	2,761.23	55,224.60
No. 12 to No. 13	1	216	3,118.62	673,621.92
No. 13 to No. 14	1	13	3,377.88	43,912.44
No. 14 to No. 15	1	11	3,111.93	34,231.23
No. 15 to No. 16	1	223	3,203.59	714,400.57
No. 16 to No. 17	1	13	3,865.80	50,255.40
No. 17 to No. 18	1	91	4,747.21	431,996.11
No. 18 to No. 19	1	134	5,621.94	793,539.96
No. 19 to No. 20	1	26	5,620.72	146,133.72
Carried forward .....	..	..	....	4,007,273.89

*Superstructure of coursed Rubble
Masonry and Chunam—(continued).*

	Number.	Length.	Mean area.		SOLID FEET.
Brought forward....	..	..	....		4,007,273.58
No. 20 to No. 21	1	254	5,120.70		1,800,657.80
No. 21 to No. 22	1	15	4,503.27		67,549.05
No. 22 to No. 23	1	23	4,103.46		94,379.38
No. 23 to No. 24	1	84	3,765.03		316,266.72
No. 24 to No. 25	1	19	3,271.50		62,158.50
No. 25 to No. 26	1	90	3,063.58		275,722.20
No. 26 to No. 27	1	72	3,261.21		234,807.12
No. 27 to No. 28	1	17	3,211.47		31,594.97
No. 28 to No. 29	1	133	2,590.68		344,500.44
No. 29 to No. 30	1	218	2,183.70		476,046.60
No. 30 to No. 31	1	80	2,091.26		167,300.80
No. 31 to No. 32	1	239	1,869.58		446,829.62
No. 32 to No. 33	1	13	1,623.36		21,103.63
No. 33 to No. 34	1	174	1,450.35		252,360.90
No. 34 to No. 35	1	160	1,173.29		187,726.40
No. 35 to No. 36	1	370	904.29		334,587.30
No. 36 to No. 37	1	75	616.18		48,463.50
			Breadth.	Depth.	
Parapet	1	2,939	3	2	17,634.00
.Total solid feet.....					8,680,022.36
<i>Deduct—Masonry occupied by Sluice, vide estimate of Sluice..</i>					8,218.80
Total cubic feet Superstructure, Small Dam.....					8,671,803.56

*Superficial Feet facing of Rock
Ashlar.*

	Number.	Length.	Breadth.	SUPERFICIAL FEET.
From 0 to No. 1	1	40	4	160·00
No. 1 to No. 2	1	24	9·7	232·80
No. 2 to No. 3	1	12	13·63	164·16
No. 3 to No. 4	1	23	15·47	433·16
No. 4 to No. 5	1	23	16·19	461·72
No. 5 to No. 6	1	91	22·15	2,015·65
No. 6 to No. 7	1	235	32·01	7,529·40
No. 7 to No. 8	1	23	40·3	1,123·40
No. 8 to No. 9	1	118	44·22	5,217·96
No. 9 to No. 10	1	14	47·5	665·00
No. 10 to No. 11	1	143	51·16	7,315·88
No. 11 to No. 12	1	20	55·19	1,103·80
No. 12 to No. 13	1	216	59·67	12,888·72
No. 13 to No. 14	1	13	62·79	816·27
No. 14 to No. 15	1	11	59·51	654·61
No. 15 to No. 16	1	223	60·56	13,504·88
No. 16 to No. 17	1	13	63·31	835·03
No. 17 to No. 18	1	91	77·37	7,040·67
No. 18 to No. 19	1	134	85·96	11,518·64
No. 19 to No. 20	1	26	86·17	2,240·42
No. 20 to No. 21	1	254	81·44	20,635·76
No. 21 to No. 22	1	15	75·15	1,127·25
No. 22 to No. 23	1	23	70·92	1,631·16
No. 23 to No. 24	1	84	67·14	5,639·76
No. 24 to No. 25	1	19	61·47	1,167·93
No. 25 to No. 26	1	90	59·02	5,311·80
No. 26 to No. 27	1	72	61·37	4,418·64
No. 27 to No. 28	1	17	61·76	1,032·92
No. 28 to No. 29	1	133	52·82	7,025·06
No. 29 to No. 30	1	218	47·38	10,328·84
No. 30 to No. 31	1	80	46·04	3,683·20
No. 31 to No. 32	1	239	42·69	10,202·91
No. 32 to No. 33	1	13	38·82	504·66
No. 33 to No. 34	1	174	35·92	6,250·03
No. 34 to No. 35	1	160	27·95	4,472·00
No. 35 to No. 36	1	370	22·7	8,399·00
No. 36 to No. 37	1	75	17·57	1,317·75
Total....				169,178·89
<i>Deduct</i> —Opening of sluices				70·00
Total superficial feet Rock Ashlar...				169,108·89

Cut-stone Coping (3rd sort).

	Number.	Length.	Breadth.	Height.	SOLID FEET.
From No. 34 to No. 35	1	160	36·39	1	2,911·20
„ No. 35 to No. 36	1	370	34·81	1	6,439·85
„ No. 36 to No. 37	1	75	33·27	1	1,247·64
Parapet	1	29·39	(1·571)		4,614·17
Total cubic feet cut-stone Coping.....					15,215·86

• SLUICES, POONA SIDE.

	No.	L.	B.	H.	SOLID FEET.
<i>Coursed Rubble Masonry and Chunam, to be deducted from the Masonry of Dam.</i>					
Up to the height of extradoes of Sluice Arches.....	1	37·7	27	4·5	4,580·55
Total Deduction.....					4,580·55

	No.	L.	B.	H.	SOLID FEET.
<i>Superstructure for Sluices.</i>					
Up to the height of extradoes..	1	38½	27	4·5	4,677·75
Over projecting parts of the Arches.	..	27	1·78	1	48 06
Carried over....					4,725·81

<i>Superstructure</i> —continued.					
	Number.	Length.	Breadth.	Height.	SOLID FEET.
Brought over....	..	..	..	..	4,725·81
<i>Deduct</i> —					
Openings rectangular	4	38·5	3	3	1,386
Do. circular portion	4	38·5	area (1·021)		157·23
Arch-work	4	38·5	^m 3·6331	1	559·50
Total Deduction... ..					2,103·73
Total Superstructure					2,622·08

<i>Arch-work.</i>					
	No.	L.	B.	H.	SOLID FEET.
Arches	4	38·5	^m 3·6331	1	559·5
Total Arch-work					559·5

<i>Grooves.</i>			
	No.	L.	TOTAL RUNNING FEET.
For the shutters, two sides	2	7	14
Bottom and top	2	3·5	7
Total.....			* 21
Add for 3 more			63 .
Total.....			* 84

Teak-wood.

	Number.	Length.	Breadth.	Height.	SOLID FEET.
Teak rods	4	23	0·25	0·25	5·75
		area			
Teak planks	4	14·26		25	14·26
Total					20·01
Add one-fourth for wastage.....					5
Total					25

Chain, Iron.

	No.	L.	RUNNING FEET.
Chain	4	8	32

Crabwinch, double.

	No.
Crabwinch, double	1

Centering.

	No.	L.	B.	H.	SOLID FEET.
Rectangular portion	4	88·5	3	3	1,386·00
		area			
Circular	4	(1·021)		38·5	157·23
Total cubic feet Centering.....					1,543·23

SLUICE, KIRKEE SIDE.

<i>Coursed Rubble Masonry and Chunam, to be deducted from the Masonry of Dam.</i>	Number.	Length.	Breadth.	Depth.	SOLID FEET.
Up to the height of extradoes of sluice arches	1	<i>m</i> 33.5	21	4.5	3,638.25
Total Deduction.....					3,638.25

	No.	L.	B.	H.	SOLID FEET.
Superstructure for sluices up to the height of extradoes		39.4	21	4.5	3,723.30
Over projecting parts of the arches.	1	21	1.75	1	36.75
Total Carried over.....					3,760.05

<i>Deduct—</i>	N.	L.	B.	H.	SOLID FEET.
Openings, rectangular	3	39.4	3	3	1,063.80
„ Circular portion	3	39.4	Area. 1.021		120.63
„ Arch-work	3	39.4	3.6331	1	439.43
Total deduction.....					1,623.91
Total Superstructure.....					2,136.14

<i>Arch-work.</i>	No.	L.	B.	H.	SOLID FEET.
Arches	3	39.4	<i>m</i> 3.6331	1	439.43

Grooves.

	Number.	Length.	RUNNING FEET.
For the shutters, two sides.....	2	7	4
Bottom and top	2	3·5	7
Total.....			21
Add for two more.....			42
Total.....			63

Teak-wood.

	No.	L.	B.	II.	SOLID FEET.
Teak rods	3	·25	·25	·15	2·81
		Area.			
Teak planks	3	14·26		·25	10·69
Total.....					13·50
Add one-fourth for wastage.....					3·37
Total.....					16·87

	No.	L.	RUNNING FEET.
Chain, Iron	3	8	24

	No.
Crabwinch, double	1

<i>Centerings.</i>		Number.	Length.	Breadth.	Depth.	SOLID FEET.
Rectangular portion		3	39·4	3	3	1,063·80
			Area.			
Circular portion.....		3	1·021		39·4	120·68
Total.....						1,184·48

ABSTRACT OF SLUICE, POONA SIDE.

QUANTITIES.	ITEMS.	AMOUNT.		
		Rs.	a.	p.
2,622	Solid feet superstructure, at Rs. 18 per 100 solid feet	471	15	4
559	Solid feet arching, at Rs. 40 per ditto	223	9	7
84	Running feet cut grooves, at Rs. 2 per foot	168	0	0
25	Cubic feet teakwood, for gate, at Rs. 6 per foot..	150	0	0
32	Running feet iron chain, at Rs. 1·8 per ditto ..	48	0	0
1	Crabwinch, double, at Rs. 170 each	170	0	0
1,543	Solid feet masonry, for centering, at Rs. 16 per 100 solid feet	246	13	0
Total of Poona side....		1,477	8	11

ABSTRACT OF SLUICE, KIRKEE SIDE.

QUANTITIES.	ITEMS.	AMOUNT.
		Rs. a. p.
2,136	Solid feet superstructure, at Rs. 18 per 100 solid feet	384 7 8
439	Solid feet arching, at Rs. 40 per ditto	175 9 7
63	Running feet cut grooves, at Rs. 2 per foot	126 0 0
17	Cubic feet teakwood, for gate, at Rs. 6 per foot..	102 0 0
24	Running feet chain, iron, at Rs. 1-8 per ditto ..	36 0 0
1	Crabwinck, double, at Rs. 170 each	170 0 0
1,184	Solid feet masonry, for centering, at Rs. 16 per 100 solid feet	189 7 0
Total Rupees for Kirkee side....		1,183 8 3

ABSTRACT—SMALL DAM.

QUANTITIES.	ITEMS.	AMOUNT.
		Rs. a. p.
543,066	Cubic feet excavation for foundation in rock, at Rs. 7 per 100 cubic feet	38,014 9 11
1,545,844	Cubic feet ditto ditto in earth, at 1 rupee per ditto	15,458 7 0
1,810,454	Ditto filling in foundation with rubble, coursed, and chunam, at Rs. 15 per ditto	2,71,568 1 4
8,709,474	Ditto superstructure of coursed rubble masonry and chunam, at Rs. 18 per ditto	15,67,705 5 1
146,403	Superficial feet rock ashlar, at Rs. 28 per 100 superficial feet	4,099 4 6
15,216	Cubic feet cut stone coping, of 3rd sort, at Rs. 75 per 100 cubic feet	11,412 0 0
	Sluice Poona side, <i>vide</i> Estimate	1,477 8 11
	Ditto Kirkee ditto	1,183 8 3
Total....		19,10,918 12 8
Add contingencies at 5 per cent.		95,545 15 0
Carried forward.... Rupees		20,06,464 11 8

ABSTRACT—SMALL DAM—*continued.*

		AMOUNT.		
		Rs.	a.	p.
Brought forward....		20,06,464	11	8
<i>Extra Establishment:—</i>				
4 Carcoons for 2 years, at Rs. 20 per month.....		1,920	0	0
2 ditto for ditto, at Rs. 15 ditto		720	0	0
2 ditto for ditto, at Rs. 12 ditto		576	0	0
8 Muckadums at Rs. 10 per month		1,920	0	0
2 Chowkeedars, at Rs. 8 ditto		384	0	0
Total.... Rupees		5,520	0	0
Grand Total.... Rupees		20,11,984	11	8

WASTE WEIR.

Excavation for Foundation in Rock.					Number.	Length.	Breadth.	Depth.	SOLID FEET.
From	No. 37 to No. 38	1	138	34·42	2·0	9,499·92			
	No. 38 to No. 39	1	295	31·85	2·0	18,791·50			
	No. 39 to No. 40	1	366	29·52	2·0	21,608·64			
	No. 40 to No. 41	1	108	28·64	2·0	6,186·24			
	No. 41 to 0	1	146	27·84	2·0	8,129·28			
Total solid feet Excavation in Rock....									64,215·58

Excavation in Earth.

	Number.	Length.	Breadth.	Depth.	SOLID FEET.
From No. 37 to No. 38	1	138	30.22	5.82	24,271.49
No. 38 to No. 39	1	295	27.85	4.71	38,696.18
No. 39 to No. 40	1	366	25.52	3.24	30,262.63
No. 40 to No. 41	1	108	24.64	5.35	14,236.99
No. 41 to 0	1	146	23.84	7.83	27,253.41
Total solid feet Excavation in Earth....					134,720.70

Filling in Foundation with Rubble and Chunam.

From No. 37 to No. 38, 1st step..	1	138	34.42	1.0	4,749.96
Do. do. 2nd do. . .	1	138	32.42	1.0	4,473.96
From No. 38 to No. 39, 1st step..	1	295	31.85	1.0	9,395.75
Do. do. 2nd do. . .	1	295	29.85	1.0	8,805.75
From No. 39 to No. 40, 1st step..	1	366	29.52	1.0	10,804.32
Do. do. 2nd do. . .	1	366	27.52	1.0	10,072.32
From No. 40 to No. 41, 1st step..	1	108	28.64	1.0	3,093.12
Do. do. 2nd do. . .	1	108	26.64	1.0	2,877.12
From No. 41 to 0, 1st step	1	146	27.84	1.0	4,064.64
Do. do. 2nd do.	1	146	25.84	1.0	3,772.64
Total solid feet filling in.....					62,109.58

Superstructure of coursed Rubble and Chunam.

	Number.	Length.	Area.	SUPERFICIAL FEET.
No. 37 to No. 38	1	138	479.69	66,197.22
No. 38 to No. 39	* 1	295	343.58	101,356.10
No. 39 to No. 40	1	366	217.19	79,491.54
No. 40 to No. 41	1	108	175.32	18,934.56
No. 41 to 0	1	146	137.56	20,083.76
Total Superstructure....				286,063.18

Facing of Rock Ashlar Masonry.

	Number.	Length.	Breadth.	SUPERFICIAL FEET.
No. 37 to No. 38	1	138	16·82	2,321·16
No. 38 to No. 39	1	295	12·75	3,761·25
No. 39 to No. 40	1	366	8·76	3,206·16
No. 40 to No. 41	1	108	7·26	784·08
No. 41 to 0	1	146	3·00	438·00
Total superficial feet Rock Ashlar Masonry....				10,510·65

Coping of 3rd sort Cut-stone.

From No. 37 to No. 38	1	138	$\frac{27·42}{2}$	1
No. 38 to No. 39	1	295	$\frac{25·73}{2}$	1
No. 39 to No. 40	1	366	$\frac{24·06}{2}$	1
No. 40 to No. 41	1	108	$\frac{23·44}{2}$	1
No. 41 to No. 0	1	146	$\frac{22·87}{2}$	1
Total cubic feet Coping.....				13,025·40

*Wing Wall at the end of the
Waste Weir.*

Excavation for foundations—				
		<i>m.</i>		
Middle portion	1	17·86	12	11·68
End portions	2	39·93	14	11·68
Total cubic feet Excavation.....				15,561·96

**Deduct—*

Portions calculated in excess

Number.	Length.	Breadth.	Depth.	SOLID FEET.
2	2.165	$\frac{2.6134}{2}$	11.68	66.08
Total cubic feet Excavation for foundation.....				15,495.88

Filling in Foundations.

Middle portion, 1st step

Ditto 2nd do.

End portions, 1st step

Ditto 2nd do.

1	17.86	12	1	214.32
1	18.274	11	1	201.01
m.				
2	39.93	14	1	1,118.04
2	38.93	12	1	934.32
Total cubic feet Foundations.....				2,467.69

*Deduct—*Masonry calculated in excess, 1st
step

Ditto do. do. 2nd step ..

2	21.65	$\frac{2.6134}{2}$	1	56.58
2	(1/4 of the above result.)			14.15
Total deduction.....				70.73
Total cubic feet filling in Foundations..				2,396.96

<i>Superstructure:</i>					SOLID FEET.
	Number.	Length.	Breadth.	Depth.	
Middle portion	1	m. 19·38	m. 7·125	13·78	1,903·01
End portions	2	m. 36·53	m. 7·125	13·78	7,173·18
Junction triangular portions of waste weir with the wings.....	2	·95	$\frac{95}{2}$	$\frac{5\ 78}{2}$	2·60
Total Superstructure.....					9,078·79

ABSTRACT OF WASTE WEIR.

QUANTITIES.	ITEMS.	AMOUNT.		
		Rs.	a.	p.
64,216	Cubic feet excavation in rock, at Rs. 7 per 100 cubic feet	4,495	1	11
134,720	Do. do. in earth, at Rs. 1 per ditto	1,347	3	2
62,110	Do. filling in foundation, at Rs. 15 per do....	9,316	8	0
286,063	Do. superstructure, at Rs. 18 per do.	51,491	5	5
10,511	Superficial feet rock ashlar, at Rs. 28 per 100 superficial feet	2,943	1	3
13,025	Cubic feet coping, cutstone, 3rd sort, at Rs. 75 per 100 cubic feet	9,768	12	0
Total.... Rupees		79,361	15	9
Add contingencies at 5 per cent.		3,968	1	7
Total cost of Waste Weir.....		83,330	1	4
Establishment.....		1,032	0	0
Grand Total..... Rupees		84,362	1	4

ABSTRACT OF WING WALL.

QUANTITIES	ITEMS.	AMOUNT
		Rs. a. p.
15,496	Cubic feet excavation for foundation in earth, at Rs. 1 per 100 cubic feet	154 15 4
2,397	Do. filling in foundation, at Rs. 15 per do	359 8 9
9,079	Do. superstructure, at Rs. 18 per do.	1,634 3 6
	Total....Rupees	2,148 11 7
	Add contingencies at 5 per cent.	107 6 11
	Total....Rupees	2,256 2 6
1	Cartoon for 4 months, at Rs. 16 per month	60 0 0
1	Muckadam for 4 months, at Rs. 10.....	40 0 0
	Total....Rupees	2,356 2 6

RECAPITULATION

	Rs. a. p
Cost of Land	77,800 0 0
Dam and Sluices	2,011,984 11 8
Waste weir	84,362 1 4
Wing wall to do.	2,356 2 6
Wing wall as previously estimated....	47,321 12 0
Grand Total....Rupees	2,223,824 11 6

A. BUCKLE, Lieut. R.E.,
Assistant Engineer for Irrigation.

(1) The cost of the Dam and Sluices constructed on the formula, top = $\frac{3}{10}h$, middle = $\frac{5}{10}h$, bottom = $\frac{7}{10}h$, is as above, Rs. 2,011,984.

(2) The same dam constructed on Colonel Fife's formula of base = $\cdot 55h$, top = $\frac{1}{4}$ base, will be less in the proportion of 1,052 : 1,460, or $2,011,984 \times \frac{1 \cdot 052}{1 \cdot 460} = 1,449,730$.

Therefore the above Estimate on formula No. 1 Rs.
will be 2,223,645

On Formula No. 2 1,661,391

J. W. PLAYFAIR, Lieut. Colonel, R.E.,
Superintending Engineer for Irrigation.

CALCULATIONS of Centre of Gravity of Dam for the Irrigation Scheme, at the extreme height of 123 feet.

$$\text{Area of top rectangle KABH} = \frac{34 \cdot 8 + 36}{2} \times 3 = 106 \cdot 2$$

$$\text{Area of rectangle ABCD} = 36 \times 120 = 4320$$

$$\text{Area of } \triangle AFC = 42 \times 120 = 2520$$

$$\text{Area of } \triangle BDE = 6 \times 120 = 360$$

$$\text{Total area} \dots\dots 7,306$$

Erect a perpendicular EN on EF at E, then the area of each separate figure \times by the distance of its centre of gravity respectively from EF and EN will be equal to the area of the whole figure \times by the distance of its centre of gravity respectively from the same lines.

Therefore let x be the distance of the centre of gravity of the whole figure from EF, then

$$7,306 \times x = 106 \cdot 2 \times 121 \cdot 5 + 4320 \times 60 + 2520 \times 40 + 360 \times 40 \\ = 12903 + 259200 + 100800 + 14400 = 387,303.$$

$$x = \frac{387303}{7306} = 53$$

Let y be the distance from EN

$$7306 \times y = 106.2 \times 23.7 + 4320 \times 24 + 2520 \times 56 + 360 \times 4 \\ = 2517 + 103680 + 141120 + 1440 = 248757.$$

$$y = \frac{248757}{7306} = 34.$$

$$\text{Weight of water} = 120 \times 60 \times 62.5 = 450000.$$

$$\text{Weight of masonry} = 7306 \times 150 = 1095900.$$

Weight of water is to weight of masonry as 1 : 2.4 and acts at $\frac{1}{3}$ from the bottom.

Setting off a parallelogram proportionate to the above forces on the vertical of the centre of gravity the diagonal gives the resultant sought for.

J. W. PLAYFAIR, Lieut. Colonel, R.E.,
Superintending Engineer for Irrigation.

No. 1 OF 1866.

PUBLIC WORKS DEPARTMENT.

To the SECRETARY to GOVERNMENT,
Public Works Department.

SIR,—I have the honour to acknowledge the receipt of your No. ⁸²³₁₀₇₅ of the 14th instant, forwarding for my report papers relating to the project for a Storage Reservoir on the Moota for Irrigation and Town Water Supply.

2. In January last, just before leaving Bombay, I supplied what I believe to be all necessary explanation on the subject of Colonel Scott's remarks on the section to be given to the Reservoir Dam. If a reference be made to the letter I then wrote, I think you will find that I showed that the conditions required by the principles laid down by Rankine were more than satisfied by the section I designed. In so important a question as the dimensions of a large Dam, I did not rest satisfied with merely adopting a general rule for thickness which did not make allowance for the difference in the material employed. I went into the *principles* of construction and worked out a result on the particular conditions of the case at Poona, just as Rankine himself would have done had he been designing a section for a particular case. Had the material intended for the Dam been brickwork, the dimensions worked out in this manner would have been different.

3. While showing the manner in which the dimensions had been arrived at, and that I had not set aside Rankine's principles, but had carefully attended to them, giving the section indeed some little advantage on the side of stability, I expressed my willingness to increase the thickness of the Dam as proposed by Colonel Scott. The increase was not great, and it could have been easily carried out during construction.

4. After this I expected that the progress of the project (which is most urgently needed) towards sanction would have been rapid. I regret however to find that notwithstanding all the exertion I made when in the Deccan, and the very severe fatigue which I un-

derwent while conducting double duties to get so important a matter concluded, the movement which has since taken place is one of retrogression and not of advancement. At the end of many months it has become apparent that Lieutenant Colonel Playfair, without any orders from Government, has been employing Lieut. Buckle in preparing plans and estimates for a kind of dam which is not approved by me, nor, as far as I can judge, by Colonel Scott either, and that the large irrigation project which was to comprise the smaller one for the water supply has been delayed. I left the surveys of that project in a very advanced state, and expected that about two or three months more only would be required to complete the plans and estimates. So closely did I expect it to follow the smaller one that the latter was only separately submitted on account of the urgency of the demand for water in Poona and Kirkee, and to enable Government to see how easily water for all purposes could be obtained in abundance, and with great economy, for both domestic purposes and irrigation.

5. The first portion of Lieutenant Colonel Playfair's letter No. 927, of the 30th July, relates to the manner in which the masonry for the larger project is to be connected with that of the smaller one. I must begin by informing you that Colonel Playfair is in error in saying that it occurred to me whilst preparing the water supply project to raise the dam and increase the storage for an irrigation project. The irrigation project was the original. Colonel Playfair is again in error in saying that my reason for submitting the water supply project separately was because the larger project would occupy a long time to prepare. I have already in a previous paragraph given my reasons for submitting the water supply project separately, and it is only necessary to look at the Government Resolution on the subject of the Moota project to see Colonel Playfair's first error. *

6. With respect to the concluding part of Colonel Playfair's 2nd paragraph I would remark that it will be time enough to go formally into the question of how the masonry of the old and new work is to be connected when Government has decided what course to pursue. If the irrigation project is taken up it will be unnecessary to consider the matter at all, as the dam would from the first be carried up at its full thickness. The delay which is occurring

under Lieutenant Colonel Playfair in submitting the large project is producing the difficulty he dwells upon. In paragraph 36 of my report No. 860 A, dated 30th November last, recently published by Government, it will be observed that I say that the dam itself need not be made "higher" than is required for the water supply plan, but I do not say that it need not be made thicker. This part of my report is, I admit, not complete, as the mode of connecting the old and new masonry had not been, as well as I can now recollect, conclusively settled by me. It was in fact the very utmost I could do before leaving the Deccan for Sind to submit the project. I have merely to add now, that had Colonel Playfair submitted the complete large project within a reasonable time we should probably have been saved the trouble of considering the point at all. I have considered three modes of connecting the old and new masonry, but will not enter into a description of them here. If Government intend to carry out the irrigation project, the dam may be carried up with its full dimensions at once.

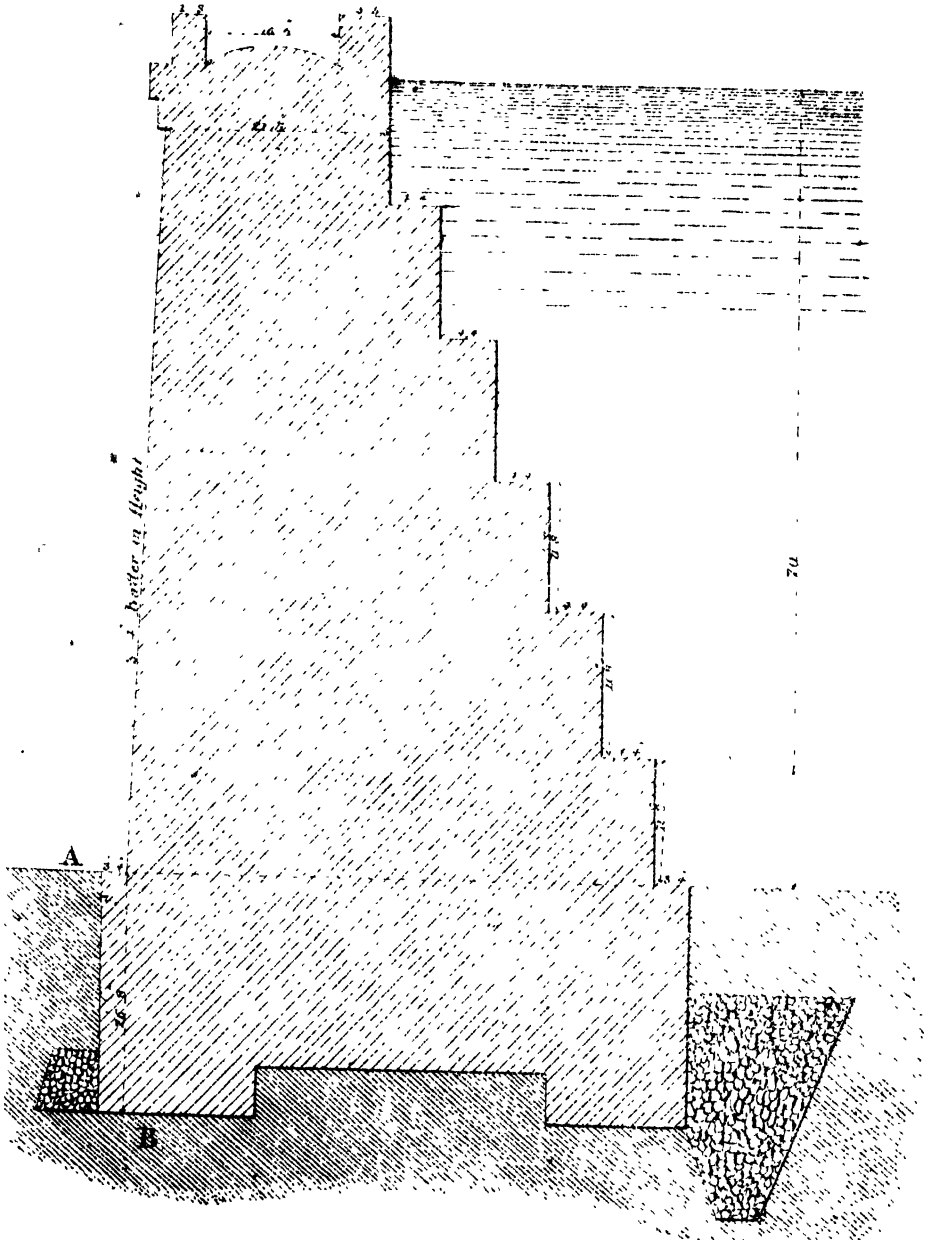
7. I will now proceed to the 2nd part of Colonel Playfair's letter, which treats of the section to be given to the dam. On this subject I concur generally with what Colonel Scott says. It is very desirable to have a massive work, but before we reject what is laid down by such well-known authorities as Moseley and Rankine, and incur an increased expenditure of many laks of rupees, we must be satisfied that they are wrong. Certainly Colonel Playfair has not established this. In the first place Colonel Playfair, though bold enough to condemn the design I submitted, and to advocate "the practical rule," which he says is contained in the *Aide Memoire*, has actually made the mistake of facing the dam the *wrong way*. The section given in the *Aide Memoire* has its batter on the water face, or inside the reservoir, but Colonel Playfair has by mistake got the batter outside. The calculations therefore given by him for the *Aide Memoire* section are erroneous.

8. In the second place the *Aide Memoire* rule makes no provision for difference in the nature of the foundation, whether soft or hard, and for difference in the quality of the material, whether light or permeable, such as brick-work ; or heavy and less permeable, such as good stone and lime masonry. So widely do circumstances differ that what Colonel Playfair calls a practical rule is merely a

rule to give a kind of average section which is useful in giving a general idea of the subject, but no further.

9. I would draw attention to the section given below, which is

Canal de Bourgogne Réservoir de Gros Bois



taken from the article in the *Aide Memoire* Lieut. Colonel Playfair quotes. It is the section of a dam which sustains 70 feet in depth of water, and rests on a soft foundation.

This section is much heavier than the one I have given for the Moota, but its strength is not in the same proportion. I would suggest that Lieut. Buckle, with whom I left my original calculations, be requested to calculate the stability of this section of the dam of the *Reservoir de Gros Bois*, with the same data that I used, and then compare it with the section which was calculated on Rankine's principles by me. The soft foundation in the case of the *Reservoir de Gros Bois* makes the subject rather complicated for comparison, but Colonel Playfair or Lieutenant Buckle might give two calculations of its stability, one supposing the Dam to turn on its foundation at A, and the foundation unyielding and incompressible as if the dam were founded on rock; the other supposing the whole mass of masonry, including foundation, to turn on the soft foundation at B. In this last case it will have to be remembered that notwithstanding the precautions used of putting concrete or puddle on each side of the foundation the least that can be calculated on is that the ground will be damp and soft under the foundation. I would gladly make these calculations myself, but I cannot afford the time at present.

10. What gives the section on Rankine's principles so much strength is the skilful manner in which the masonry is disposed as compared to the clumsy sections which the rule Lieut. Colonel Playfair wishes to apply gives. I fear we are going back in Engineering instead of forward. I would recommend Lieut. Colonel Playfair to look at the section of the waste weir, 30 feet high, of the Kossurda Tank, as a specimen of what an officer of the corps produced 25 years ago. The section of that work is very like that given by Rankine, but it is slighter.

11. The object of the conclusion of Lieut. Colonel Playfair's letter is not apparent. What I believe is required by Government is the submission of the Plans and Estimates for the Irrigation Project with the least possible delay, and not a letter about them

to say that they involve drawing plans and calculations. Had I remained in the Deccan they would have been submitted long ago.

I have the honour to be,

Sir,

Your most obedient Servant,

J. G. FIFE, Lieut. Colonel, R.E.,

Acting Chief Engineer in Sind.

Kurrachee, 31st August 1866.

No. 887 M.

Government of India.**PUBLIC WORKS DEPARTMENT.***Military Works.*

To the ACTING SECRETARY to GOVT. of BOMBAY,
in the Public Works Department.

Simla, 8th September 1866.

SIR,—With reference to previous correspondence and to the

* No. $\frac{107 \text{ M.W.}}{520}$, dated 22nd
March 1866.

No. $\frac{52 \text{ C.W.}}{1233}$, dated 20th June
1866.

No. $\frac{637 \text{ C.W.}}{1347}$, dated 3rd July
1866.

letters* marginally noted on the subject of water supply for Poona and Kirkee, I am directed to communicate the following observations and orders of the Government of India.

2. In December 1864 the Bombay Government submitted a project for the water supply of the Poona Cantonment from a reservoir in the Ambeygaum valley, five miles to the south-west, at a cost of Rs. 7,55,538. The project was approved of by the Government of India as sound, but, in the face of the possibility of the troops being ordered to be removed from Poona to Kirkee, it could not then be definitely entertained. The cost was, however, deemed excessive as an outlay of Imperial funds for a single cantonment, unless some means were taken to make the public pay their share; and it was suggested that it might be undertaken by a private company, or by the municipality, Government agreeing to pay for the water supplied to the troops (*see* P. W. D. No. 387 M, dated 4th April 1865).

3. In March 1865 the Bombay Government sent up another project for the water supply of the station of Kirkee from a reservoir in the Pashan valley, about 3 miles to the west, at a cost of Rs. 2,73,238. The Government of India deferred a full reply

till the question of the force to be located at Kirkee was settled, but called for the details of the project in P. W. D. No. 363 M, dated 29th March 1865. The reply was received in April, in which it was stated that, as the demand for water was urgent, and the project one which could be extended to any number of troops, and in all respects very suitable, it was hoped sanction would not be delayed. Some important points of detail in the project had, however, still to be supplied, and it was not until 15th August that the Government of India was able to issue orders (No. 905 M). Sanction was then given to the project, remarking, however, on the large proportion of the supply, 60 per cent., given to the Government garden, the small scale on which the supply to the troops was calculated, the importance of arranging for some return in the shape of water rate for the supply to private persons, and the arrangements to be made for the security of the supply to the fortified post. The Secretary of State fully confirmed the views and criticisms of the Government of India in a despatch which was communicated to Bombay on the 17th February 1866, No. 201 M.

4. Inquiry having been made in June 1865 on the subject of steam engines which were supplied by the liberality of a Parsee gentleman to facilitate the supply of water to Poona, the Bombay Government replied in November that this was a temporary arrangement, and did not affect the permanent water supply question, but that a new project was in contemplation which would embrace the supply of the Poona and Kirkee cantonments, and afford a larger and better supply at less cost than the two projects before sent up. A report by the Sanitary Commission was also submitted. In reply it was said in P. W. D. No. 1335 M, dated 4th December 1865, that the new project would be awaited.

5. This contemplated new project has since been sent up prepared by Colonel Fife, according to which the cost of the whole water supply is to be Rs. 18,21,679. It, therefore, does not, as regards the contemplated outlay, answer the expectations of the Bombay Government as to being less costly than the previous projects.

6. Notwithstanding its great cost, nothing is said on the subject of obtaining a return in the shape of water rate for the

outlay. In fact the remarks of the Government of India and of the Secretary of State on this important subject are totally unnoticed. Nor is there any notice whatever taken of any of the other points on which the Government of India recorded remarks ; unless in the brief mention (para. 4 of the Bombay letter No. $\frac{107}{526}$ M. W. of 1866) that the new project was to provide 20 gallons per head for every person, European and Native, likely to be located at Kirkee, the previous project having allowed only 15 gallons for Europeans and 5 for Natives, while the Government of India laid down 30 gallons for Europeans and “a fair proportion for Natives.”

7. The Government of Bombay pressed strongly in its letter of 22nd March 1866 the urgency of the want of water, the excellence of the project, and the necessity for immediate sanction. And on the call made by the Government of India for the details of the project which had not been sent up, that Government urges in its letter of 20th June the same things, especially on the ground of the ability and experience of Colonel Fife, the projector, in such matters.

8. The special reasons given by the Government of Bombay for deciding that the first project for Kirkee was insufficient, are that it was discovered that the engines ordered out for the Powder Factory were *condensing* engines, and would require upwards of 400,000 gallons a day to work them instead of the moderate quantity (10,800 gallons) before calculated. Also that it would require 350,000 gallons of water per day to water the turf in the enclosure to keep down dust. At all events, it was considered by the Bombay Government that 600,000 gallons would be required for the Ordnance establishments, and the cost of the extra supply would be Rupees 2,72,452 in excess of the sanctioned sum, say—

For the Engines 350,000 gallons at Rs. 1,58,930

For watering Turf .. 250,000 „ „ 1,13,522

Total . . 6,00,000 Rs. 2,72,452

9. Referring to these large sums, the Government of India would, *first*, inquire why, if condensing engines require so much more water, it might not be better to get them changed to non-condensing, as the cost of this change would apparently not amount

to a lakh and a half of rupees ; *second*, why it should be worth while to spend so much for watering grass when, possibly, it might be arranged to suspend the manufacture of powder at the driest season so as to avoid the dust ; and, *third*, since the water used for condensing steam is not lost, why *that* water should not be used for watering the turf instead of providing an additional supply for the purpose.

10. Half a gallon per minute per horse-power is a usual allowance for the feed of a condensing engine,—that is, 30 gallons per hour, or 300 gallons per working day of 10 hours. Now the whole horse-power of all the engines for the Ordnance factories at Kirkee is to be 129. They will require, therefore, 38,700, or, say, 40,000 gallons of water per day for *feeding*. The water for condensing is usually reckoned at 10 times as much as for feeding. It would appear that the Bombay Government has in this manner got at its estimate of over 400,000 gallons a day. But it has not been noticed that the whole of the condensing water, barring waste, and at least one-fourth of the feeding water is got back again, and may be used over and over again as long as there is a sufficient store of water to allow of its cooling. On the other hand it is necessary in India to allow about double the quantity of condensing water on account of its higher temperature. Although, therefore, more water might be required for actual use, it might not be necessary to provide nearly so much on the whole if arrangements were made to store and use over again the condensing water.

11. Then for watering turf 350,000 gallons a day are estimated for. This is enough to cover 31 acres of land with a depth of half an inch of water daily, and it is three times as much as is allowed in the estimate for 50 acres of Government garden (112,500 gallons). It is true that the Government of Bombay does not take quite the full requirement, since the demands for the factory are cut down for this and the steam engines from 750,000 gallons to 600,000. But this hardly appears to be a sufficient reduction. Considering the cost of and demand for water, it is thought by the Government of India that 170,000 gallons a day on the average should be made to suffice both for the steam-engines and watering turf.

12. The Bombay Government gives the following estimate of the entire quantity of water required daily for Kirkee :—

	Gallons daily.
Ordnance factories	600,000
Government House and Garden.....	123,000
Remainder, said to be at 20 gallons a head for all residents, European and Native, present and prospective	211,665
Total, as at page 5 of Colonel Fife's project. . .	<u>934,665</u>

Considering what was said by the Government of India on the former occasion of the submission of the project for water supply at Kirkee, a reduction of 53,000 gallons may, perhaps, be allowed in the item of the Government garden. And the supply for persons and cattle for the existing population may be reduced to Dr. Leith's estimate of 160,000 gallons. Thus the immediate wants of Kirkee may be set down at—

	Gallons daily.
Ordnance Factories	170,000
Government House and Garden	70,000
Population and Troops.....	160,000
Total. .	<u>400,000</u>

13. Now, if it be remembered that there are wells affording a supply of water which, however scanty, has heretofore been made to suffice for the wants of the place, there does not appear to be any ground at present for demanding more than an *additional* supply at the rate of 250,000 gallons daily. This supply is that which the sanctioned Pashan project was calculated to afford at a cost of Rs. 2,73,238.

14. It is to be remembered, too, that the Pashan project is quite a different drainage to the new enlarged project, and its execution would not at all interfere with the *ultimate* construction of the other; while there are obvious reasons for desiring that, ultimately, there should be more than one independent source of supply. Besides this, the early construction of some works for water supply may be necessary in order to get the new factories to work as soon as possible.

15. There is, however, an argument at page 2 (para. 5) of Colonel Fife's project which, though not specially urged by the Bombay Government, requires to be considered as adverse to the construction of the smaller tank. It is to the effect that, since so large a lake as that of Vehar, of 1,319 acres area and 1,592,236,889 cubic feet contents, has become impure from the action of the climate in the hot season, there is little chance of the smaller reservoir of Ambeygaum (for the Poona supply) of only 77 acres area and 48,154,093 cubic feet contents, escaping from similar contamination.

The proposed Pashan lake for the Kirkee supply is still smaller, being, though 100 acres in area when full, only 36,352,322 cubic feet of contents. The lake proposed for the larger project would be 3,360 acres in area when full, and 2,299,468,000 cubic feet of contents.

16. Now, in comparing the extent of the latter with that of the Vehar lake, it will be apparent that there is no such difference as to lead to the conclusion that the proposed lake will certainly escape from the contamination which the Vehar lake has suffered, if that contamination be due to want of sufficient size. So far, therefore, the argument seems to go against the larger project also. It may be admitted that the smaller reservoirs are more likely to become contaminated. But, if the risk be greater, the money risked is very much less. Further, it is hoped by the Government of India that some means may be devised for preventing the water in reservoirs from becoming bad. . And, again, for the steam-engines and watering turf, at all events, it is probable that the water from the reservoir would be good enough.

17. From the foregoing observations it appears to the Government of India that it has not been fully established that the best course is now to abandon the sanctioned Pashan project in favor of the larger one.

18. The larger project now submitted by the Government of Bombay involves so great an outlay that the Governor General in Council is unable to sanction it, and is unable even to recommend it for the sanction of the Secretary of State till it is brought to a complete state, and the probability of its proving remunerative is fully established.

19. I am directed, however, to state that the Government of India is very far from desiring to discourage this project. On the contrary it seems to promise very well, and in an engineering point of view to be very skilfully and satisfactorily arranged so far as perfected. No plan is more likely to lead to the satisfactory attainment of a cheap and effectual water supply to the city of Poona and its adjacent cantonments than a project which shall combine with that object a scheme for irrigation on a considerable scale. But still the principles laid down by the Government of India and the Secretary of State require that, before such projects are undertaken, it should be fully shown that they will be remunerative as well as likely to be otherwise successful. Unless they are so, no scheme for providing funds for their construction on a large scale can be practicable.

20. There are two points in the larger project which may, perhaps, be noticed at this stage. The first is that of the dimensions of the dam for the lake, which is to be of masonry, and 88 feet high. A difference of opinion has arisen between Colonel Fife and the Superintending Engineer of the Southern Division, Colonel Scott, to whom the project had been referred for opinion by the Bombay Government. Colonel Scott's report is not sent up. He, however, considered that the thickness of the dam should be increased. In reply Colonel Fife quotes Professor Rankine, who lays down the principle that a dam in firm soil is quite safe when the centre of pressure is within one-fourth of the thickness from the centre of the base. Thus Colonel Fife has determined his dam. But Professor Rankine goes on to deduce a simple practical rule from the above theoretical principle, namely, that the thickness at base should be 60 per cent. of the height, and the thickness at top 15 per cent., when the front is perpendicular.* This practical rule gives somewhat larger dimensions than the theoretical one, and is, therefore, safer.

* It is very nearly so in Colonel Fife's design.

It, therefore, should be adopted. Colonel Fife says of Colonel Scott's proposal, "It will not add very largely to the cost to increase its thickness to the slight extent mentioned, and, of course, if the Government desire it, the increase can be made, but I am

perfectly satisfied myself of the sufficiency of the section." He would, therefore, probably not object to the addition suggested.

21. The other point is that, in order to embrace irrigation as well as water supply to the city and cantonment, Colonel Fife proposes to add to the height of his dam, and to increase its thickness accordingly. The Government of India would suggest that on this point Colonel Fife may be asked to consider whether, instead of doing this, it would not be better to construct one or more additional reservoirs. 88 feet is a high dam. It may be admitted that the lake is narrow, and, therefore, its discharge would be less sudden than in the case of a breach of a wide lake; but, when there is a large city below, it will be better to have two or more reservoirs instead of leaving the safety of the project and of the neighbourhood to depend entirely upon the stability of a single dam. Some increase of height may be admissible, but the expediency of adding 34 feet to the height seems to require very full consideration.

22. Allowing that the project would be remunerative, the water supply of Poona, which, as Colonel Fife says, would require only about one-thirtieth of the entire supply available, would practically be got for nothing more than the bare cost of distribution, or about $4\frac{1}{2}$ lakhs for the supply of 3 or 4 millions of gallons daily. In this sense it is quite true that the larger project would be *cheaper* for the water supply. But it would only be cheaper after an outlay for irrigation of 30 or 40 lakhs had been provided.

23. Colonel Fife is naturally anxious to be allowed to begin at once on his dam* before the details of the rest of the project are completed.

* Page 15, paragraph 39.

This would, doubtless, save time, and so be advantageous. But, until the financial arrangements for irrigation works generally are settled, it does not seem possible to arrange this, and on principle it is undesirable to deviate from the rule of permitting no actual construction until projects are fully matured.

24. In conclusion, then, I am to state that the Government of India regrets to be unable, from financial reasons, and owing to the necessity for proceeding with system and caution in the exten-

sion of irrigation works, to give sanction to any immediate outlay on the very promising Kurrukswalla project. It would, therefore, desire the Bombay Government to reconsider the question of proceeding with the Pashan reservoir. If the Bombay Government should be able to recommend such a course and will supply the information the Government of India formerly asked for, the Governor General in Council will be prepared to consider it. But in the meantime no delay should be allowed to occur in completing the estimate for the Kurrukswalla project, both as to the works for irrigation and the probable income.

I have the honor to be,

Sir,

Your most obedient Servant,

C. H. DICKENS, Lieut. Colonel, R.A.,

Secretary to the Government of India.

**SELECTIONS FROM THE RECORDS OF THE BOMBAY
GOVERNMENT.**

IRRIGATION SERIES —No. III.

IRRIGATION PROJECTS

FOR

THE BOMBAY PRESIDENCY.

LAND IN THE PAHRA AND GODAVERY VALLEYS,

NFAR

NEWASSA,

IN THE AHMEDNUGGUR COLLECTORATE.

(THE LAKH PROJECT.)

~~~~~  
**WITH A MAP & PLANS.**

**PLANS IN A SEPARATE CASE.**  
~~~~~

Bombay:

PRINTED FOR GOVERNMENT, By PEARSE AND SORABJEE

—
1866.

MEMORANDUM.

Dam—Length 1,500 feet. Greatest height 15 feet. Cost Rs. 58,783.

Canal—Length 21 miles. Cost Rs. 1,00,167.

Average lowest breadth 13 feet. Fall to the 6th mile 1 foot.

10 „ „ to the 18th „ $1\frac{1}{2}$ „

9 „ „ to the 21st „ 2 „

16 Aqueducts.

5 Escapes.

10 Communication Bridges.

1 Bungalow and Out-houses.

Total cost, Rs. 2,11,292.

Area irrigable 18,000 acres.

Probable Net Revenue :—

Mr. Griffith's (Executive Engineer) Estimate Rs. 32,365.

Major Francis' (Revenue Survey) „ „ 40,235.

Estimate of maintenance Rs. 10,035, *i. e.* 5 per cent on the Estimate.

No. 2077 OF 1865.

PUBLIC WORKS DEPARTMENT.

FROM THE ACTING REVENUE COMMISSIONER S. D.,

TO THE CHIEF SECRETARY TO GOVERNMENT.

Poona, 19th June 1865.

SIR,—I HAVE the honor to submit herewith, in original, a letter from the Superintending Engineer for Irrigation, No. 72, dated 25th January 1865, together with its accompaniments, among which are Plans and Estimates for a project for irrigating 18,000 acres of land in the Paihra and Godavery Valleys, near Newassa, in the Ahmednuggur Collectorate.

2. The Commissioner of Survey, Major Francis, having been requested by Mr. Morgan, Acting Revenue Commissioner in letter No. 523, dated 11th February 1865, to favor this Department with his opinion on the project, has made the following remarks:—

“ 2.—I agree with the Collector, that the Executive
“ Engineers’ water rates are too low, but at the same time,
“ I consider his own to be too high to be safely taken as
“ the basis for estimating the out-turn of this project : nine
“ Rupees per acre, which is the Collector’s maximum for
“ perennial irrigation, would not, I admit, be thought high
“ on old Established Irrigational Works; but in carrying
“ out a new work of this kind, we must take into account
“ the circumstance of the people of the District not being
“ accustomed to irrigated cultivation, and consequently not
“ alive to the profits derivable therefrom, and therefore
“ that favorable rates are required in the first instance, to
“ induce them to take to a new kind of cultivation. I

“ think, therefore, it would be advisable on this and other
 “ accounts, to have our rates lower than they would be
 “ under ordinary circumstances.

“ 3 .It is my opinion, therefore, that for perennial water
 “ the rate should not exceed six rupees per acre at first.
 “ This is exclusive of the regular Jerayet or dry crop as-
 “ sessment imposed under the Survey Assessment. I
 “ would also fix a lower sum for the cold weather and
 “ monsoon water rates, which should not, I think, exceed
 “ four and two rupees per acre respectively. The above
 “ would generally assimilate to the rates fixed for Patthus-
 “ thul lands in other parts of the Collectorate, and might
 “ therefore continue in force till a general revision of the
 “ settlement of the District takes place.

“ 4. The estimated annual revenue derivable from the
 “ project, according to the foregoing rates, would be, as
 “ follows:—

“ 1,500 acres under perennial irrigation at the	
“ rate of rupees 6 per acre.....	9,000
“ 5,400 under rubbee crops at rupees 4 per acre.	21,600
“ 10,100 under monsoon crops at rupees 2 per	
“ acre.....	20,200
	<hr/>
“ Total Estimated annual Return.....	50,800

Deduct :

“ Annual maintenance charges at 5 per cent,	
“ on outlay.....	10,565
	<hr/>
	Rupees..... 40,235
	<hr/>

“ Calculated upon these rates the scheme is estimated to
 “ yield a return of nearly 20 per cent on the outlay.

“ 5. There can, I think, be no question that in a finan-

“ cial point of view, the project will be highly remunera-
 “ tive; for whether you take the Collector’s comparatively
 “ high Estimate of realizable revenue, or my own more
 “ moderate, or the Executive Engineers’ low return, the
 “ result in any case will be extremely favorable.”

3. I concur in the views expressed by Major Francis in paras. 2 and 3, and would beg to recommend the adoption of the rates proposed by him, although they are somewhat lower than they would be under ordinary circumstances.

4. Government will observe that even under the lower rates proposed by Major Francis, the result of the project is likely to be very favorable in a financial point of view.

I have the honor to be,

Sir,

Your most obedient servant,

J. W. HADOW,

Acting Revenue Commissioner S. D.

No. 72 OF 1865.

PUBLIC WORKS DEPARTMENT.

FROM LIEUT. COL. FIFE, SUPERINTENDING ENGINEER FOR IRRIGATION,
 TO THE REVENUE COMMISSIONER, SOUTHERN DIVISION,
 Poona.

Camp Konoor, 25th January 1865.

SIR,—I HAVE the honor to forward for submission to Government for sanction Plans and Estimates for a project for irrigating 18,000 acres in the Paihra and Godavery Valleys, near Newassa in the Ahmednuggur Collectorate.

2. The merit of suggesting this project and shewing its practicability and great promise is due to Captain Finch who has recently returned to his old appointment at Ahmednuggur. In fact Captain Finch went so far as to prepare an estimate for the work in 1861, but the plans could never be found after Captain Finch's departure to England, and the estimate was not considered sufficiently detailed for the project to be sanctioned by Government till a detailed survey was made.

3. The requisite survey was commenced in October 1863, by Mr. Griffith, who had been specially appointed for irrigation works in the Ahmednuggur Collectorate, and the Plans and Estimate now submitted are the result of his labours. I may add that the project would long ago have been submitted by him, but for his having latterly had double duties to carry on, and I know that it was only by extraordinary exertion, from which I believe his health suffered, that he has been enabled to furnish the project before his departure on sick certificate to England.

4. The River Pailra whence the project will draw its supply of water is a branch of the Godavery, and is fed from the Western Ghats. Its perennial stream is large for so small a river. During the monsoon, the supply of water is of course enormous, and I am sure this work will be a most successful one. If more perennial irrigation should ever be required than the present perennial stream will suffice for, it can be afforded by adding a temporary earthen dam to the top of the weir during the fair season, and ponding up a supply of water against the hot weather, and catching any occasional showers that may fall in April or May.

5. The details of the plans have been very carefully discussed by myself and Mr. Griffith, and many of them have been modified to meet my views. I have now merely therefore to mention that, with the exception of two or three minor points on which a memorandum is attached to this letter, I approve of the plans and estimates.

6. With respect to the Revenue Return that will be obtain-

ed from this work I beg to forward a letter No. 1779, dated 3rd September 1864, from the Collector of Ahmednuggur. The rates of assessment on which Mr. Griffith bases his estimate of return are those which were fixed by Major Anderson, Superintendent of Revenue Survey, for the Kristna Irrigation. They are certainly low, and Mr. D'Oyly recommends much higher rates. My own impression is that low rates are best at first, and I think that where there is such a material difference in the value of the perennial crops, such as sugar-cane, and the monsoon crops, such as jowarree, it would be best to commence with a crop assessment till the people learn to use the water properly, and learn what effect can be produced by a given quantity of water. These are, however, points which may be discussed hereafter. It will be sufficient to

Gross Revenue	Rs. 42,400
Deduct:—	
5 per cent on Rs.	
211,298 for work-	
ing Expenses	10,565
Net Revenue	Rs. 31,835

mention here that the low rates used by Mr. Griffith even, show a net return of Rupees 31,835 or 15 per cent on an outlay of Rupees 211,298.

7.—I should explain here that the project now submitted is very much larger than was at first contemplated. It is necessary to mention this, otherwise Government will not understand how the detailed estimate amounts to Rs. 211,298 while I reported last year that the work could be carried out for Rupees 80,000. It was originally intended to irrigate about 7,000 acres only, but the project now submitted will irrigate 18,000 acres, and the masonry works are designed rather larger than the Canal, in order to admit an increase to the supply of water hereafter, without our having to undergo much extra expense. I may also mention here that Mr. Griffith's estimate has been corrected from Rupees 2,00,696 to Rupees 211,298 in this office.

8.—Provision has been made in the Imperial Budget for 1865-66 for this work, but it would be a great matter if Government could sanction a sum of Rupees 20,000 to be expended during the current year, as this would enable us to seize upon the most favorable period of the year to get in the foundations of the weir and com-

mence other masonry works which might afterwards be continued without difficulty during the rains. I fear that unless a commencement of this work can be at once sanctioned the allotment for the coming year cannot be of much use till October next.

I have the honor to be,

Sir,

Your most obedient servant,

J. G. FIFE, Lieut. Colonel, R. E.

Superintending Engineer for Irrigation.

NOTES ON SOME OF THE DETAILS OF PLANS.—BY
THE SUPERINTENDING ENGINEER FOR IRRIGATION,
(LIEUT. COLONEL FIFE, R. E.)

THE Section of the weir is amply strong enough, but the top is not quite enough rounded to be secure from injury from a tree rolling over it. This can be remedied during the construction. It would also be better to give the weir a slight batter on the downstream side instead of the up stream. The face work will be close jointed and no injury will occur, therefore when a very small quantity of water is passing over the weir. When there is any considerable quantity the water will shoot quite clear of the face of the wall.

2. The simple kind of sluice at the head of the Canal will answer, as the greatest head of water will only be 6 feet. Square baulks will, however, have to be substituted for the planks, as the latter under such a head would be unmanageable.

3. The escapes must be arched over as it is found most dif-

ficult to close them when they are simple notches, though they answer in that form when the depth of water does not exceed $1\frac{1}{2}$ or 2 feet.

J. G. FIFE, Lieutenant Colonel, R.E.,
Superintending Engineer for Irrigation.

No. 11 of 1865.

Ahmednuggur, 4th January 1865.

FROM F. GRIFFITH, Esq., Ex. Engineer for Irrigation,

To Lieutenant Colonel J. G. FIFE, R. E.,

Superintending Engineer for Irrigation.

PUBLIC WORKS DEPARTMENT,

Office of the Ex. Engineer, Irrigation.

SIR,—I HAVE the honor to submit for your consideration and approval plans and estimates amounting to Rs. 2,00,696 for the construction of a weir with the necessary head works on the River Paihra, about a mile below the village of Lakh in the Rahooree Talooka of the Ahmednuggur Collectorate, and from thence of an irrigating canal winding parallel to the general course of the river for a distance of 21 miles into the foot of the Rivers Paihra and Godavery.

2. The Lakh irrigation project was originally proposed in 1861 by Captain Finch, R. E., who was then Executive Engineer of these districts, but on a very much smaller scale and with a prospect of a less favorable result, than may be expected from the scheme. I have now the honor to submit a cursory survey and a very rough estimate only appear to have been made of the original project, and a total absence of hench marks on the field, and of plans or field books rendered it necessary to recommence the investigation from the very beginning.

3. On being appointed to the irrigational charge of the Ahmednuggur Collectorate in September last, I at once proceeded by your direction to make the surveys necessary for the project, after completing which, press of business compelled me to defer till the comparative leisure afforded by the monsoon, the formation of the plans and estimates necessary to bring the matter to a conclusion.

4. The volume of water brought down by the Pailra river varies considerably with every month in the year. In the monsoon the stream fed from its sources in the Western Ghats is very large, and nearly independant of local rain, which in a part of the country that frequently suffers severely from failure of the monsoon is a favorable point for consideration in the present scheme. Owing to the cold weather the usual supply is still large, though variably, having been guaged by Captain Finch to be in March 18th at 39 cubic feet per second, and by yourself in December 1862 105 feet, whilst in the middle of October last, during a slight fresh, I approximately estimated the discharge at 450 feet.

5. From information carefully collected from villagers on the banks of this river it may fairly be assumed that even in the dry months of March, April and May, a supply of 20 feet may be confidently expected, though to guard against the slightest chance of over estimating the profits, and to allow a margin for consumption and wastage at villages, I have calculated only 15 cubic feet as available for perennial cultivation, for the months during which water is required for rubbee crops. I am, I believe, within the mark in setting down a supply of 36 feet per second in addition, whilst during the monsoon a much larger supply would be available than is required for the land under command, but if it is found that monsoon irrigation is appreciated by the ryots, a canal can at any time be opened on the right bank of the river.

6. The perennial supply, counted on is, it will be observed, small, as must generally be the case with rivers rising in the Western Ghats, and following eastwards. There is, however, a considerable stream available up to the end of February, and frequently heavy showers falling in April and May increase the sup-

ply considerably for several days at a time. From the local nature of these rivers they can only be made generally useful by the formation of irrigational works like that under consideration.

7. The land available for irrigation by natural flow in the Lakh project is estimated at 39 square miles, or 25,000 acres, while the water supply calculated on the before mentioned data is sufficient to irrigate a still larger area. But allowing 8,000 acres to lie fallow each year, by rotation, the following statement will shew that the calculations have been made on a much smaller area, which will leave a supply of water available for watering monsoon crops by motes or scoops which would probably be eagerly taken advantage of by the ryots in most seasons, as frequently but little rain falls in the early monsoon in this neighbourhood.

Table Shewing Cultivation anticipated.

15 cubic feet per second for 12 months for sugar-cane crops at 100 acres per foot per second	1,500
36 cubic feet per second for four months for rubbee crops at 150 acres per foot per second.....	5,400
101 cubic feet per second for four months for monsoon crops at 100 acres per foot per second.....	10,100

Annual cultivation.....acres 17,000

8. I have calculated the net revenue to be expected from the Lakh irrigation project on data which appear to me to give ample margin for unforeseen contingencies, as well as for incidental expenses, that though foreseen cannot yet be accurately estimated.

Table of Revenue.

1,500 acres perennial cultivation at Rs. 4 per acre.....	6,000
5,400 do. Rubbee do. at Rs. 3 per do.....	16,200
10,100 do. Monsoon do. at Rs. 2 per do ..	20,200

Total..... 42,400

Deduct cost of maintaining works and supervision 5 per
cent on the amount of the estimate..... 10,035

Net Revenue Rs. . 32,365

From the above table it will be seen that after making ample allowance for repairs and the current expenses of management, the net Revenue to be expected is 16 per cent on the whole outlay.

9. I cannot help remarking whilst considering this part of the subject on the exceedingly low rate charged by Government as water assessment. From information carefully gleaned from the villagers in this neighbourhood, who variously state the net profit to be derived from an acre of sugar-cane irrigated by moles at from Rs. 100 to Rs. 200, according to the nature of the soil, and the means at the disposal of the cultivator. I learn that with the prices at present prevailing, and with regard to the excellent quality of the soil irrigable by the proposed canal, were the supply of water for perennial irrigation divided amongst the different villages and put up to auction as much as from Rs. 20 to Rs. 30 per annum would be freely obtained, per acre, for water sufficient to irrigate sugar-cane, the gross produce from which is said to be from Rs. 300 to Rs. 400. I beg, therefore, most earnestly to urge the necessity of a re-consideration of the whole question of water-rates, and to state that in my humble opinion the sale of water by auction would be no greater infringement of existing rights than the public auction of waste lands; indeed I believe it would be a boon to the ryots, and would stimulate them by degrees to introduce an improved system of agriculture.

10. It remains briefly to notice the nature of the works provided for in the estimate that accompanies this report. The weir itself will have a total mean length of 1,500 feet, and its height in the deepest part of the River bed will be $15\frac{1}{2}$ feet. The crown of the dam is 3.14 feet above ordinary and 1.66 below extraordinary flood line, but it will cause the afflux of only $4\frac{1}{4}$ feet in the latter case on account of the great length of overfall. No damage is likely to be done to the villages above the dam site even in

very high floods. The flanks of the weir will be protected by wing walls and embankments to a height of 10 feet above the highest known flood line, or 7 feet above what the same flood would be were the weir erected. On the right flank a breast wall is added to protect a soft part of the bank, immediately below the weir, which it is advisable to preserve uninjured.

11. The water will enter the canal through a regulating head of 2 arches of 7 feet span and four feet high to springing, small enough to be easily managed, they will be closed by teakwood planks dropped singly into grooves on the face of the arches. They will be furnished with stout hooks at each end so that they can easily be raised by iron rods.

12. The Channel will pass from the head through a short rock cutting into a small valley where it will at once begin to irrigate and will have the sections shewn in the following table:—

Table of Sections of Canal.

Miles	Width at bottom	Depth	Fall per Mile	Discharge per second	Tide slopes		
From 1st to 3rd Mile	14	4	1	182 4	1½	to	1
Ditto 4th to 6th ditto	13	4	1	149 7		Do	
Ditto 7th to 10th ditto	12	3½	1½	140 2		Do	
Ditto 11th to 13th ditto	11	3½	1½	130 8		Do	
Ditto 14th to 16th ditto	10	3½	1½	121 5		Do	
Ditto 17th to 18th ditto	9	3½	1½	102 3		Do	
Ditto 19th to 20th ditto	8	3	2	92 9		Do	
Ditto 21st to end of canal	8	3	2	92 9		Do	

Approximate quantities are given of moorum and rock cutting which will also occasionally be met with, but it was impossible without spending much more time than I had at my disposal, to determine accurately the quantities of each kind of soil likely to

be met with. As it is considered sufficiently certain that monsoon cultivation will be very largely in request, it has been thought best to add 25 per cent to the width of the aqueducts and bridges at once, leaving the canal to be widened if required. As the supply of water that would be available in the monsoon, if required, would be very much larger than that for which the canal is designed and a great deal of land above the canal level would be irrigable by means of moles or scoops.

13. On the whole length of 21 miles of canal the following masonry works will be required :—

Bundura.

With head work wing breast and screen walls.

Aqueducts

2 of 1 arches of 10 feet span	$17\frac{1}{4}$	breadth at bottom.
1 of 6 ditto	do. $16\frac{1}{4}$	ditto.
3 of 1 ditto	do. $16\frac{1}{4}$	ditto.
4 of 1 ditto	do. 15	ditto.
1 of 2 ditto	do. 15	ditto.
2 of 1 ditto	do. $13\frac{3}{4}$	ditto.
1 of 4 ditto	do. $13\frac{3}{4}$	ditto.
2 of one arch of 10 feet span,	$12\frac{1}{2}$	feet broad at bottom.

Escapes.

one escape of 2 openings 2 feet wide 4' deep.

Three do. do. 2 „ 3 „

one do. , 3 do. 2 „ 3 „

3. Communication bridges of 32 feet span.

5. Ditto ditto 25 ditto.

2. Ditto ditto 22 ditto.

25 Regulators for branch canals.

Bungalow.

One two roomed bungalow with out-houses.

14. The mode of distribution at the heads of branch canals is left for farther consideration, but calculating a branch at about every $\frac{3}{4}$ of a mile, allowance is made in the estimate of 25 Regulators, which I think will be found quite sufficient.

15. A small bungalow is also provided for in the estimate, as it is necessary that an Executive Officer should reside on the spot during the construction of the works, and a competent superintendant afterwards. This might be erected near the village of Bardapoor being a healthy and central position.

16. In concluding my report I trust I may be allowed to state that in my humble opinion there is in the Lakh scheme every favorable point usually looked for in such a project:—Good land, source of water independant of local supply; inexpensive line of country, with a total absence of heavy cuttings, masonry works or any other engineering difficulties whatever.

17. Irrigational schemes are presented just now under the double disadvantage of unprecedented high cost of construction and exceedingly low rates of water assessment. Were the present scheme to be estimated on the rates of construction prevailing five years ago, when the water rate was as high as it is now, I am convinced the net revenue to be derived would not fall short of 50 per cent., a profit that I venture to say may still be expected if the water assesment be raised to correspond in some slight degree with the increased price obtained by the ryot for his labour and produce.

18. Should you obtain the sanction of Government, as I trust you will, to the immediate commencement of this work, I shall be prepared to break ground at the shortest notice, and a grant of Rs. 60,000 will enable me in the current year to lay the foundation of the weir, complete the wing walls and head works, and do so much of the earth work that I should be in a position, I trust, to complete the work in the year following.

I have the honor to be,

Sir,

Your most obdt. servant,

F. R. GRIFFITHS, R. E.,

Ex. Engineer for Irrigation, A. & N.

No 1779 OF 1864.

Ahmednuggur, 3rd September 1864.

FROM W. D'OYLY, Esq., Collector of Ahmednuggur,
To Lieutenant Colonel J. G. FIFE, R. E.,
Superintending Engineer for Irrigation,

POONA,

Ahmednuggur, Collector's Office.

SIR,—HAVING been requested by the Executive Engineer for Irrigation to express my opinion regarding the Lakh scheme, I have the honor to state, without entering into the professional details, that if it is allowed that it pays to irrigate by damming rivers, the scheme under consideration must answer, if properly carried out, as all the requisite natural facilities are there at hand.

2. I will now enter upon the subject of the rates. I entirely agree with the Executive Engineer that the water rates on which his calculations are based are much too low, so much so that by imposing such rates I consider that we are wantonly throwing away the resources of Government. I do not, however, agree with the Executive Engineer that it is advisable to put the water up to auction, such course is open to two objections, the villagers may bid spitefully against each other and ruin themselves by agreeing to pay too high rates, or they may combine in order to lower the rates. I think the rates should be fixed authoritatively once for all.

3. I think the following would be very moderate rates: Rupees 9 for perennial irrigation, Rupees 5 for cold weather, and Rupees 3 for monsoon irrigation. Taking the Executive Engineer's figures as to the amount of land which will be irrigated the returns will be as follows:—

1,500 acres perennial irrigation at Rupees 9...	13,500
5,400 cold weather at Rupees 5.....	27,000
	<hr/>
	40,500

which after deducting 5 per cent. for expenses gives nearly 18 per cent. on the outlay.

Add 10,100 Monsoon irrigation at Rupees 3...	30,300
	<u>70,800</u>

which gives after making the necessary deductions upwards of 30 per cent. on the outlay.

4. I have purposely separated the monsoon from the fair weather irrigation, as I think doubtful whether the Cultivators will at first be very willing to grow crops which require irrigation during the monsoon: I have no doubt, however, that they will do so after a time, but some years will probably elapse before the whole amount calculated is realized.

5. The rates I have proposed will of course have to be considered by the Revenue Commissioner and by Government. I think I have written enough to show that the scheme must yield a fair return and that there is a fair prospect of the returns being very large indeed.

I have the honor to be,

Sir,

Your most obedient servant,

W. D'OYLY,

Collector.

III. PUBLIC IMPROVEMENT.

K.—AGRICULTURAL.

1. Irrigation Canal.

PUBLIC WORKS DEPARTMENT.—*Ahmednuggur Collectorate.*

No. 5 of 1864-5.

Estimate framed by F. R. Griffith, Esquire, Executive Engineer for Irrigation A. and N., of the probable cost of constructing a Bundara across the river Paihra, with irrigating canal including

the necessary aqueducts, bridges and escapes, estimate framed agreeably to instructions contained in Government Resolution, No. 2365 of 26th November 1863 received under Superintending Engineer for irrigation, endorsement, No. 751 of 14th December 1863, amounting to

Rupees... 2,11,298 0 0

GENERAL DESCRIPTION.

Bundara across the river Pailra and head works.

The Bundara to be 1500 feet mean length and 8 feet in width at the top to allow of a temporary earthen bund being erected on it in the dry season, to pond up the water above the weir with a batter of 2 in 15 on the up stream side, making the mean thickness equal 60 of the height. Its position and direction is so laid out as to secure a foundation throughout on solid rock. The south end of the Bundara to be raised 2 feet above the north end to turn the water freely towards the canal mouth, and to save the south bank from floods.

The greatest height of the weir will be 15.5 feet above the bed of the river, on the right and left banks screen walls will be built 600 feet in length, having a top width of 3 feet with an offset of 8 inches every $2\frac{1}{2}$ feet of depth and rising to a height of 7 feet above the highest flood known, after allowing for the afflux calculated for that height of flood, these screen walls are flanked by earthen embankments carried on at 2 feet above the height of the screen wall to the high ground beyond.

The steep bank on the right flank is further protected by a wing wall on the down stream-side of the weir, 150 feet in length, of the same height as the screen walls.

The head works consist of 2 regulating arches in the wing wall of the left bank 7 feet in width, and 4 feet up to springing which will be closed by strong teakwood planks dropped singly into grooves cut in the cutwaters of the pier and abutments, the canal for the first 200 feet after leaving the regulator will be furnished with a breast and screen wall, which, in the event of the regulator being accidentally left open during a fresh will act as an

escape weir of this length, and prevent injury to the canal from any rush of water.

The weir head work wing and breast walls, all to be formed of good large coarsed rubble masonry, the faces of all works exposed to action of water to be of large stone carefully hammer dressed, so that no wide joints may be left.

The foundation to be laid of the same material as the superstructure, and none but good hydraulic lime to be used and the whole superstructure to be well pointed.

Six scouring sluices 4 by 2 to be placed two near each end of the weir as per plan, and 2 in the canal to be closed with teak planks. All planks for sluice gates to be of well seasoned teak wood in planks one foot in width 3" thick fitted with strong iron hooks for the convenience of raising and lowering.

All grooves and faces for shutters to be of cut stone, dressed 2nd sort.

Earth Embankments to be raised in layers, watered and rammed 1 foot at a time.

Every thing to be constructed in accordance with the plans and estimates as they may be sanctioned.

MEASUREMENTS.

	Number.	Length.	Breadth.	Height.	SOLID FEET.
<i>Excavation in Moorum and Black soil.</i>					
Screen wall Right side 1st portion... ..	1	100	4.5	5.5	21175
" " 2nd "	1	100	4.83	6.20	2994.60
" " 3rd "	1	100	5.33	8	4264
" " 4th "	1	100	5.5	11.20	6160
" " 5th "	1	100	5.83	12	6996
Screen left side 1st portion.....	1	335	13	4	1742
" " 2nd "	1	65	5.5	4	1430
" " 3rd "	1	240	4.83	4.5	5216.40
" " 4th "	1	265	4.17	3.5	3887.67
Bundara right side 1st portion.....	1	180	10.60	13	24804
" " 2nd "	1	140	10.80	5.5	2376
" " 3rd "	1	100	11	2.80	3080
" " 4th "	1	20	10.80	1.5	324
" " 5th "	1	40	10.90	1	436
Carried over.....	.....	.....	.....	.....	66165.67

*Excavation in Moorum and Black soil—
(continued.)*

	Number.	Length.	Breadth.	Height.	SOLID FEET.
Brought over.....	.....	.....	.....	.....	66165 67
Bundara left side 1st portion.....	1	25	9-70	2	485
" 2nd "	1	16	9-90	3	475-20
" 3rd "	1	20	10-30	5	1030
" 4th "	1	18	10-20	7	1285-20
" 5th "	1	125	10-5	7-5	9843-45
" 6th "	1	23	10-20	5-5	1290-30
" 7th "	1	23	10	4-70	1081
" 8th "	1	27	9-80	4-20	1111-32
" 9th "	1	108	9-60	5	5184
" 10th "	1	140	9-70	6	8148
" 11th "	1	32	9-40	4-40	1323-52
" 12th "	1	27	9-30	3-5	878-85
" 13th "	1	130	9-10	3-5	4140-5
" 14th "	1	42	9-20	6	2318-40
Wing walls.....	1	150	5-83	12	10494
Breast walls.....	2	200	4-33	9	15588

Solid feet excavation in Moorum and Black soil... 130812-71

Excavation in Rock.

	Number.	Length.	Breadth.	Height.	SOLID FEET.
Bundara 1st portion	1	180	10-10	1-80	3272-40
" 2nd "	1	40	10-30	2-20	906-40
" 3rd "	1	100	10-5	2	2100
" 4th "	1	20	10-30	1-90	391-40
" 5th "	1	40	10-40	2	832
" 6th "	1	20	10-30	2-20	453-20
" 7th "	1	40	10-5	2-20	924
" 8th "	1	80	10-5	2	1680
" 9th "	1	20	9-90	2-5	495
" 10th "	1	20	9-80	2	392
" 11th "	1	20	9-90	3-20	633-60
" 12th "	1	140	10-20	2-20	3141-60
" 13th "	1	20	9-10	2-5	495
" 14th "	1	40	9-70	2	776
" 15th "	1	20	9-30	3	558
" 16th "	1	25	9-20	2	460
" 17th "	1	16	9-40	2-5	376
" 18th "	1	20	9-80	2-5	490
" 19th "	1	18	9-70	2-5	436-5
" 20th "	1	120	10	2	2400
" 21st "	1	23	9-70	3	669-30
Carried over.....	.....	.....	.....	.....	21880 95

Excavation in Rock.— (continued.)

	Number.	Length.	Breadth.	Height.	SOLID FEET.
Brought over....	..	..	..	..	21,880.95
Bundara 22nd portion.. .. .	10	23	9.5	2	437
" 23rd " .. .	1	27	9.30	2.20	552.42
" 24th " .. .	1	108	9.10	2	1,965.60
" 25th " .. .	1	142	9.20	2.20	2,874.08
" 26th " .. .	1	32	8.90	2	569.60
" 27th " .. .	1	27	8.80	2	475.20
" 28th " .. .	1	130	8.60	2.30	2,571.40
" 29th " .. .	1	42	8.70	2	730.80
Screen-wall left side, 1st portion.....	1	335	13	.80	348.40
" 2nd " .. .	1	65	4.83	.80	251.16
Breastwalls.....	2	200	3.83	2	3.064
Solid feet excavation in Rock..					33,720.61

*SOLID FEET.**Filling in Foundation.*

Same as Excavation in rock.....	3,722.06
Solid feet filling in foundation..	35,722.06

Superstructure.

	Number.	Length.	Breadth.	Height.	SOLID FEET	SOLID FEET.
Bundara 1st portion	1	180	mean. 8.80	12	19,008	
" 2nd " .. .	1	40	8.90	13.40	4,770.40	
" 3rd " .. .	1	100	9	14.70	13,230	
" 4th " .. .	1	20	8.90	13.60	2,420.80	
" 5th " .. .	1	40	8.95	14.30	5,119.40	
" 6th " .. .	1	20	8.90	13.25	2,358.5	
" 7th " .. .	1	40	9	14.80	5,328	
" 8th " .. .	1	80	9	14.5	10,440	
" 9th " .. .	1	20	8.70	10.30	1,792.20	
" 10th " .. .	1	20	8.65	9.5	1,643.5	
" 11th " .. .	1	20	8.70	10.30	1,792.20	
" 12th " .. .	1	140	8.85	13	16,107	
" 13th " .. .	1	20	8.70	10.13	1,762.62	
" 14th " .. .	1	40	8.60	9	3,096	
" 15th " .. .	1	20	8.40	5.90	991.20	
" 16th " .. .	1	25	8.35	5.5	1,148.12	
Carried over....	..	..	..	..	91,007.44	

Superstructure.—(continued.)

	Number.	Length.	Breadth.	Heigh.	SOLID FEET.	SOLID FEET.
Brought over.....	..	..	..	..	91,007·04	
Bundara 17th portion.....	1	16	8·45	6·70	905·84	
" 18th "	1	20	8·65	8	1,384	
" 19th "	1	18	8·60	9·40	1,455·12	
" 20th "	1	125	8·75	11	12,031·25	
" 21st "	1	23	8·60	8·80	1,740·64	
" 22nd "	1	23	8·5	7·40	1,446·70	
" 23rd "	1	27	8·90	5·80	1,393·74	
" 24th "	1	108	8·80	4·40	4,181·76	
" 25th "	1	142	8·35	5	5,928·5	
" 26th "	1	32	8·20	2·80	734·72	
" 27th "	1	27	8·15	2	440·10	
" 28th "	1	130	8·5	·80	884	
" 29th "	1	42	8·10	1·5	510·30	
Triangular Portion over Bundara.	2	24·25	8·	12	4,656	
			mean			
Screen-wall right side 1st portion.	1	100	3·5	10	3,500	
" 2nd "	1	100	3·66	12·25	1,174·5	
" 3rd "	1	100	3·93	14·5	5,698·5	
" 4th "	1	100	4·60	16·60	7,360	
" 5th "	1	100	4·53	19·20	8,697·60	
			mean.			
Right Abutment.....	1	12	8	4	384	
			mean.			
Left. "	1	12	7·5	4	360	
Pier.....	1	9·5	3	4	114	
Cut-water Triangular..	1	1·30	3	7	27·30	
			area.			
" Semicircular.....	1	..	3·53	7	24·71	
Masonry over Pier and abutment.	1	33·5	9·5	11·5	3,659·87	
Left side screen-wall 2nd portion.	1	65	4	15·20	3,952	
" 3rd "	1	240	3·66	8·90	7,817·76	
" 4th "	1	265	3·33	5·80	5,118·21	
Wing-wall.....	1	150	4·53	19·20	13,046·40	
Breast-walls.....	2	200	3·16	3·5	4,424	
Curved portion on the right screen-wall.....	1	600	..	1	612	
			area.			
" Triangular Pier.....	2	51·5	..	2·69	277·07	
			area.			
" on Bundara.....	1	1450	..	2·69	39	
			area.			
Screen-wall left side 1st portion.	1	33·5	..	3·176	106·39	
			area.			
" 2nd "	1	570	..	1·02	561·40	
			area.			
" over-wing wall.	1	150	..	1·02	153	
			area.			
" Breast wall....	2	200	..	1·02	408	
Carried over....	..	..	..	..	....	196,216·42
						196,215·42

Superstructure.—(continued.)

	Number.	Length.	Breadth.	Height.	SOLID FEET	SOLID FEET.
Brought over....	..	..	..	..	...	1,96,216.42
Deduct Archways....	2	9.5	..	area. 7.24	137.56	
Sluices.....	6	9	4	2.	432	
Arches over sluices.....	6	9	..	area. 12.57	678.78	1,248.34
Solid feet Superstructure..						197,463.76

Earthwork.

					Number.	Length.	Breadth.	Depth.	SOLID FEET.
Earthwork.									
Right side embankment 1st portion..					1	320	mean 17.85	mean 3.14	17,935.68
"	"	2nd	"	..	1	100	mean 27.5	7	19,250
"	"	3rd	"	..	1	100	mean 33.37	mean 9.35	31,200.95
"	"	4th	"	...	1	100	mean 40	mean 12	48,000
"	"	5th	"	..	1	100	mean 35.20	mean 10.08	35,481.60
"	"	6th	"	..	1	100	mean 17.82	mean 7.82	55,740.96
Left	"	1st	"	..	1	550	mean 17.5	mean 7.5	72,187.5
"	"	2nd	"	..	1	565	mean 33.5	9.40	177,918.5
"	"	3rd	"	..	1	400	mean 25	mean 6	60,000
Solid feet Embankment..									517,715.19

Woodwork.

	Number.	Length.	Breadth.	Height.	SOLID FEET.
Plank fitted in gates	2	8	.25	7	28
" "	6	5	.25	7	52.5
Solid feet Teakwood work..					80.5

Iron Work.

Iron Work

No. of Iron Work.....

Number.

16

16

ABSTRACT.

		Rs.	a.	p.
130,842.71	Solid feet excavation in Moorum and black soil at Rs. 1-0-0 per 100 solid feet	1,308	6	8
35,722.06	Solid feet excavation in rock at Rs. 8-0-0 per foot	2,857	12	2
35,722.06	Solid feet filling in foundation with rubble stone and lime masonry at Rs. 20-0-0 per foot.. .. .	7,144	6	7
194,967.98	Solid feet superstructure with rubble stone and lime masonry at Rs. 20-0-0 per foot.. .. .	38,993	9	6
517,715.19	Solid feet earth embankment at Rs. 0-12-0 per foot.. ..	3,882	13	10
80.5	Solid feet wood work at Rs. 4-0-0 per foot.	322	0	0
16	No. iron hooks at Rs. 0-12-0 each	12	0	0
Contingencies at 5 per cent.		54,521	0	9
		2,726	0	10
<i>Extra Establishment.</i>				
2	Carcoons at Rs. 10 per month for two years	480	0	0
4	Muccadums at Rs. 8-0-0	768	0	0
2	Chowkedurs at Rs. 6-0-0	288	0	0
Total Rs..		58,783	1	7

CANAL.

SPECIFICATION.

The canal to be 21 miles and 600 feet in length, and to be divided into the following sections:—1st portion from the 1st to the 3rd mile to be 14 feet broad at bottom and four feet deep; 2nd portion from the 3rd to the 6th mile to be 13 feet broad at bottom and four feet deep; 3rd portion from 6th to 10th mile to be 12 feet broad at bottom and $3\frac{1}{2}$ feet deep; 4th portion from the 11th to the 13th mile to be 12 feet broad at bottom and $3\frac{1}{2}$ feet deep; 5th portion from the 14th to the 16th mile to be 10 feet broad at bottom and $3\frac{1}{2}$ feet deep; 6th portion from the 15th to the 18th mile to be 9 feet broad at bottom and $3\frac{1}{2}$ feet deep; 7th portion from the 19th to the 20th mile to be 8 feet broad at bottom and 3 feet deep; 8th portion from the 21st mile to the end of the canal to be 8 feet broad at bottom and 3 feet deep.

The side slopes for Rock cuttings to be 6" to one, and for Moorum 1 to 1 and for soil $1\frac{1}{2}$ to 1.

All embankments to be raised in one foot layers, watered and rammed with an outside slope of 20 to one, and a berm on each side to be formed 10 feet wide from the edges of canals, and the spoil earth to be formed into embankment outside of this berm.

The banks are to be made 3 feet above highest water level, wherever water line comes much above level of ground.

MEASUREMENT.

<i>Earth Work Excavation.</i>	Number.	Length.	Breadth.	Height.	SOLID FEET.	SOLID FEET.
<i>1 Mile.</i>						
1st Portion	1	800	16-75	5	67,000	
2nd "	1	1,000	20-37	9-75	198,637-5	
3rd "	1	1,000	16-62	7-75	128,800	
4th "	1	1,000	2-15	5	107,500	
5th "	1	1,000	21-12	4-75	100,320	
6th "	1	1,000	27-27	8-85	241,339-5	
7th "	1	280	31-77	11-85	105,412-86	
						948,979-86
<i>2 Miles.</i>						
1st Portion	1	720	30-52	10-75	236,224-80	
2nd "	1	1,000	31-37	10-75	337,227-5	
3rd "	1	1,000	33-32	11-30	393,176	
4th "	1	1,000	30-40	10-10	307,040	
5th "	1	1,000	28-76	9-00	258,340	
6th "	1	560	27-94	7-71	120,633-7	
						1,652,642-00
<i>3 Miles.</i>						
1st Portion	1	700	24-87	7-25	126,215-25	
2nd "	1	1,000	21-87	5-25	114,817-5	
3rd "	1	1,200	20-52	4-35	107,114-40	
4th "	1	600	20-30	4-20	51,156	
5th "	1	700	19-02	3-35	44,601-90	
6th "	1	1,080	18-87	3-25	66,233-70	
						510,138-75
<i>4 Miles.</i>						
1st Portion	1	1,000	20-25	3-5	617,625	
2nd "	1	1,000	21	4	84,000	
3rd "	1	1,000	19-5	3	58,500	
4th "	1	1,000	17-87	3-25	58,077-5	
5th "	1	1,000	17-12	2-75	47,080	
6th "	1	280	17-12	2-75	13,182-40	
						878,464-90
Carried over..	..	...	..	..	....	3,910,225-51

MEASUREMENT..	Number.	Length.	Breadth.	Height.	SOLID FEET.	SOLID FEET.
<i>Earth Work Excavation.—(contd.)</i>						
Brought over..	..	..	..	..	....	3,990,225·51
5 Miles.						
1st Portion	1	600	18·25	3·5	38,325	
2nd "	1	1,000	18·25	3·5	63,875	
3rd "	1	1,200	17·5	3	63,000	
4th "	1	900	18·25	3·5	57,487·5	
5th "	1	500	18·25	3·5	31,937·5	
6th "	1	600	17·87	3·25	34,846·5	
7th "	1	480	5·57	3·75	10,026	
						299,497·5
6 Miles.						
1st Portion	1	480	19·37	4·25	59,514·80	
2nd "	1	550	18 02	3·35	32,201·85	
3rd "	1	600	16·97	2·65	26,982·30	
4th "	1	1,100	10·55	2·37	43,145·85	
5th "	1	600	15·80	1·87	17,727·60	
6th "	1	1,100	16·85	2·30	41,618·5	
7th "	1	850	17·12	2·75	30,018	
						231,208·90
7 Miles.						
1st Portion	1	900	14·80	1·87	24,908·40	
2nd "	1	600	15·40	2·27	20,974·80	
3rd "	1	800	16 72	3·15	42,134·40	
4th "	1	1,200	16·87	3·25	65,793	
5th "	1	300	15·67	2 45	11,517·45	
6th "	1	900	15·60	2·40	33,696	
7th "	1	580	17·17	3 45	34,337·17	
						233,361·22
8 Miles.						
1st Portion	1	550	17	3·37	31,509·5	
2nd "	1	1,150	16·87	3·25	63,050	
3rd "	1	850	16·68	3·12	44,235·36	
4th "	1	850	18·55	4·37	68,903·97	
5th "	1	1,000	18·15	4 10	74,415	
6th "	1	880	15·70	2·47	34,125·52	
						316,239·35
9 Miles.						
1st Portion	1	320	15·75	2·5	12,600	
2nd "	1	1,200	13·87	1·25	20,805	
3rd "	1	1,200	14·47	1·65	28,650·60	
4th "	1	600	16·72	3·15	31,600·80	
5th "	1	300	18·45	4 30	23,800·5	
6th "	1	1,360	19·70	3 80	116,781 60	
						234,238·50
Carried over.	..	..	..	..	....	5,304,770·98

MEASUREMENT

Earth work Excavation.—(contd.)

Brought over....		5,304,770 98
10 Miles.							
1st Portion	1	1,100	17 80	3 87	75,774 60	3,72,569 10
2nd	"	1	1,000	17 43	3 62	63,096 60	
3rd	"	1	1,000	17 73	3 82	67,728 60	
4th	"	1	1,000	19 05	4 70	89,535	
5th	"	1	1,000	19 98	3 32	66,333 60	
6th	"	1	180	19 35	2 90	10,100 70	
11 Miles.							
1st Portion	1	900	17 30	4 20	65,394	3,84,201 24
2nd	"	1	600	17 75	4 5	47,925	
3rd	"	1	1,000	17 75	4 5	79,875	
4th	"	1	1,000	17 18	4 12	70,781 60	
5th	"	1	1,000	16 80	3 87	65,016	
6th	"	1	780	17 18	4 12	55,209 64	
12 Miles.							
1st Portion	1	1,200	18 5	3	66,600	3,38,801 60
2nd	"	1	1,000	18 65	3 10	57,815	
3rd	"	1	1,000	19 40	3 60	69,840	
4th	"	1	1,000	18 68	3 12	58,281 60	
5th	"	1	1,080	17 75	4 59	86,265	
13 Miles.							
1st Portion	1	1,400	18 80	3 87	1,01,858 40	2,70,077 95
2nd	"	1	1,000	17 12	2 75	47,080	
3rd	"	1	900	14 85	2 57	34,348 05	
4th	"	1	990	10 05	2 70	36,571 5	
5th	"	1	1,080	15 5	3	50,220	
14 Miles.							
1st Portion	1	650	15 25	3 5	34,693 75	2,74,147 95
2nd	"	1	1,000	16	4	64,000	
3rd	"	1	1,000	16	4	64,000	
4th	"	1	1,200	14 30	2 87	49,249 20	
5th	"	1	1,430	14 5	3	62,205	
Carried over..							
		6,954,568 82

	Number.	Length.	Breadth.	Height.	SOLID FEET.	SOLID FEET.
MEASUREMNT.						
Earth work Excavation.—(contd.)						
Brought over.....						6,954,568.82
15 Miles.						
1st Portion	1	500	16 68	3 12	46,837 44	307,675 19
2nd „	1	1,000	17 25	3 5	60,375	
3rd „	1	750	17.62	3 75	49 556 25	
4th „	1	1,400	16 37	4 25	97,401 5	
5th „	1	1,230	14 5	3	53,505	
16 Miles.						
1st Portion	1	900	13 37	2 25	27,074.25	235,246.85
2nd „	1	1 000	14 30	2 87	41,041	
3rd „	1	1 000	15 05	3 37	50,718 5	
4th „	1	1,000	14 87	3 25	48,327 5	
5th „	1	180	14 80	3 20	22,732 80	
6th „	1	380	14 80	3 20	22,732 80	
7th „	1	520	14 5	3	22,620	
17 Miles.						
1st Portion	1	650	14 82	3 55	34,197 15	291,155.30
2nd „	1	1,000	14 82	3 55	52,611	
3rd „	1	1,000	13 87	3 25	45,077 55	
4th „	1	1,000	14.80	3 87	57,276	
5th „	1	1,000	15 63	4 42	69,084 60	
6th „	1	630	14 43	3 62	32,909 05	
18 Miles.						
1st Portion	1	500	16 43	3 62	29,738 30	262,112 78
2nd „	1	1,000	15 87	3 25	51,577.5	
3rd „	1	900	13 85	2 30	36,148 5	
4th „	1	1,000	13 92	2 95	41,064	
5th „	1	1 000	14 25	3 5	49,875	
6th „	1	830	15 07	4.05	53,709.48	
19 Miles.						
1st Portion	1	1,000	13.82	3.55	49,061	288,787.70
2nd „	1	950	14.62	3.75	52,083 75	
3rd „	1	950	14.62	3.75	52,083 75	
4th „	1	1,090	15 00	4	60,000	
5th „	1	1,000	14.70	3.80	55,860	
6th „	1	380	14.40	3.60	19,699.20	
Carried over.....	8,339,546.64

MEASUREMENT.					SOLID FEET.	SOLID FEET.
<i>Earth work Excavation.—(contd)</i>						
Brought over....	1,17,464 30	8,339,516 61
20 Miles.						
1st Portion	1	700	14 70	3 80	39,102	2,19,116 75
2nd „	1	1,000	13 12	2 75	36,080	
3rd „	1	600	12 75	2 5	19,125	
4th „	1	900	13 87	3 25	10,569 75	
5th „	1	1,200	13 5	3	48,600	
6th „	1	880	13 5	3	35,610	
21 Miles.						2,11,121 5
1st Portion	1	300	12 95	3 30	12,820 5	
2nd „	1	1,000	13 5	3 67	49,515	2,11,121 5
3rd „	1	1,000	13 25	3 5	46,375	
4th „	1	1,000	12 30	2 87	35,301	
5th „	1	1,000	12 12	2 75	33,330	
6th „	1	980	12 5	3	36,750	
22 Miles.						7,06,280
1st Portion....	1	600	12 5	3	22,500	
Additional Excavation in side Cuttings to supply Material for banks wherever the Excavation in the Canal itself is insufficient.						22,500
3rd Mile	2	1,200	11 40	4 25	1,16,280	7,06,280
5th „	2	1,000	11 10	4 25	96,900	
8th „	2	800	13 25	5 5	1,16,000	
9th „	2	1,000	15	6	1,80,000	
12th „	2	300	22 5	9	1,21,500	
14th „	2	600	12 5	5	75,000	
Deduct on account of Aqueducts.....						25,513
Solid feet excavation ..						9,476,021 89
<i>Excavation in Moorum.</i>						
1 Mile.						
1st Portion	1	800	15	2	24,000	84,000
2nd „	1	1,000	15	2	30,000	
3rd „	1	1,000	15	2	30,000	
Carried over..						84,000

Excavation in Moorum.—(contd.)

	Number.	Length.	Breadth.	Height.	SOLID FEET.	SOLID FEET.
Brought over...	...	...	...	..	.....	84,000
<i>2 Miles.</i>						
1st Portion	1	720	16.5	2.5	29,700	
2nd „	1	1,000	16.5	2.5	41,250	
3rd „	1	1,000	16.5	2.5	41,250	
4th „	1	1,000	16.5	2.5	41,250	
5th „	1	1,000	16.5	2.5	41,250	
6th „	1	560	16.5	2.5	41,250	
						2,35,950
<i>4 Miles.</i>						
1st Portion	1	1,000	14	1	14,000	
2nd „	1	1,000	14	1	14,000	
3rd „	1	1,000	14	1	14,000	
						42,000
<i>9 Miles.</i>						
1st Portion	1	1,560	13.5	1	21,060	
						21,060
<i>10 Miles.</i>						
1st Portion	1	1,000	13.5	1.5	20,250	
2nd „	1	180	13.5	1.5	3,645	
						23,895
<i>12 Miles.</i>						
1st Portion	1	1,200	12.5	1.5	22,500	
2nd „	1	1,000	12.5	1.5	18,750	
3rd „	1	1,000	12.5	1.5	18,750	
4th „	1	1,000	12.5	1.5	18,750	
						78,750
<i>13 Miles.</i>						
1st Portion	1	1,400	12	1	16,800	
2nd „	1	1,000	12	1	12,000	
						28,800
<i>15 Miles.</i>						
1st Portion	1	900	11	1	9,900	
2nd „	1	1,000	11	1	11,000	
3rd „	1	750	11	1	8,250	
						29,150
<i>17 Miles.</i>						
6th Portion	1	650	10	1	6,500	
						6,500
Carried over..	..	...	..	..	.....	5,50,105

Excavation in Moorum.—(contd.)

	Number.	Length.	Breadth.	Height.	SOLID FEET.	SOLID FEET
Excavation in Moorum.—(contd.)						
Brought over...	....	....	....	....	....	550,105
18 Miles.						
1st Portion	1	500	10	1	5,000	52,800
2nd „	1	1,000	10	1	10,000	
3rd „	1	900	10	1	9,000	
4th „	1	1,000	10	1	10,000	
5th „	1	1,000	10	1	10,000	
6th „	1	880	10	1	8,800	
19 Miles.						
1st Portion	1	1,000	10	1	10,000	10,600
Solid feet excavation in Moorum..						612,995

ROCK CUTTING.

1 Mile.

	Number.	Length.	Breadth.	Height.	SOLID FEET.
1st Portion	1	800	15.25	3	36,600
2nd "	1	1,000	16	4	64,000
3rd "	1	1,000	16	4	64,000
Solid feet Rock Cutting..					164,600

EMBANKMENT.

4 Miles.

	Number.	Length.	Breadth.	Height.	SOLID FEET.	SOLID FEET.
4th Portion	1	1,000	7.75	1	7,750	17,670
5th "	1	1,000	7.75	1	7,750	
6th "	1	280	7.75	1	2,170	
Carried over..	..	..	..	..	.....	17,670

					SOLID FEET	SOLID FEET.
EMBANKMENT —(continue 1.)						
	Number	Length.	Breadth.	Height.		
Brought over ....	..	..	..	..	....	17,670
5 Miles						
2nd Portion	1	600	6 75	5	2 325	
3rd "	1	1 600	6 75	5	3 375	
4th "	1	1,200	6 32	75	5,688	
5th " ..	1	1 00	6 13	25	14,467 5	
6 Miles						25,855 5
2nd Portion ..	1	550	7 15	65	2,518 97	
3rd " ..	1	600	8 36	1 35	6,741 60	
4th " ..	1	1,100	8 85	1 63	15,868 65	
5th " ..	1	600	9 72	2 13	12 122 16	
6th " ..	1	1,100	2 97	1 70	5 553 90	
7th " ..	1	850	8 18	1 25	8,641 25	
8 Miles						51,855 93
7th Portion ..	1	880	8 67	1 53	11,673 28	
9 Miles						11,673 28
1st Portion ..	1	320	6 87	50	1 099 20	
2nd " ..	1	1 200	9 01	1 75	18 121 00	
3rd " ..	1	1,200	8 36	1 35	13 515 20	
						33,563 40
Solid feet embankment..						140,618 11

ABSTRACT.

96 98,515	Solid feet excavation at Rupee 6 1 1 6 per 100 solid feet..	72 7 81	9
6,12 005	" " in Moorum at Rupees 1 0 0 ..	6,120	0 9
1 61,000	" " Rock Cutting at Rupees 8 0 0 ..	13 1 68	0 0
1,40 617	" " Embanking at Rupees 0 6 0 ..	527	5 0
Total		92,569	3 6
Contingencies at 5 per cent ..		4,628	2 7
ESTABLISHMENT			
4 Carcoons for 2 years at Rupees 10 per month..	..	960 0 0	
8 Muccadams " at Rupees 8 " ..	..	1,536 0 0	
4 Chowkedars " at Rupees 5 " ..	..	480 0 0	
Total Rupees..		1,00,167	6 1

Afflux caused by the weir calculated from the following formula from Downny's Hydraulic

$$Q = 3.488 L H \sqrt{H + 0.0349 W^2} + 4.96 L (A-B) \sqrt{H + 0.0111 V^2} \quad \text{where } Q = 77299$$

mean
L = 1500

$$77299 = 3.488 \times 1500 \times H \sqrt{H + 0.0349 \times 6.7657^2} + 4.96 \times 1500 + 1.5 \sqrt{H + 0.0111 \times 6.7657^2}$$

where H = to be found
mean velocity after
construction
of weir

$$\text{where } W = 1.25 + 5.4126 = 6.7657$$

$$77299 = 5232H \sqrt{H + 1.60} + 11160 \sqrt{H + 0.46}$$

$$\text{where } A = 17$$

$$\text{where } B = 15.5$$

In this equation the value of H = 4.215 nearly

F. R. GRIFFITH, C. E.,
Executive Engineer for Irrigation

AQUEDUCT No. 4.

GENERAL DESCRIPTION.

The aqueduct to consist of one segmental arch of 10 feet span, 2 feet rise, one foot thick. Abutments to be 3 feet thick; backing over abutments and piers to be carried up to the blocking course, with a layer of 6 inches of concrete on top to render the masonry watertight. Foundations and abutments to be carried down 3 feet in steps of one foot thick, each with 3 inches offsets. The wing walls to be carried 20 feet into the banks of the Nulla. Aprons to be constructed on both sides, 5 feet broad, between arches.

AQUEDUCT OF ONE ARCH 10 FEET SPAN

MEASUREMENTS

<i>Excavating Foundation.</i>					SOLID FEET.
	Number	Length	Breadth	Depth	
Abutments....	2	26	4.5	mean 3	702
Wingwalls 1st portion ..	4	9.5	4.5	5	855
„ 2nd „ ..	4	27.23	4.75	mean 4.75	517.37
„ 3rd „ ..	4	19.77	3.5	mean 1.75	276.78
Apron on both sides	2	19	5	1.75	332.5
Solid feet excavating foundation .					2,633.65

*Filling in Foundation with uncoursed Rubble
Stone and Lime Masonry.*

	Number.	Length.	Breadth.	Depth.	SOLID FEET.
Abutments.....	2	mean. 25.5	4	3	612
Wingwalls 1st portion	4	mean. 9.62	4.5	3	519.48
„ 2nd „	4	area. 27.23		2	217.84
„ 3rd „	4	area. 19.77		2	158.16

Solid feet filling in foundation with uncoursed stone and lime.. 1,507.48

*Superstructure. Coursed Rubble
Stone and Lime Masonry.*

	Number.	Length.	Breadth.	Height.	SOLID FEET.	SOLID FEET.
Abutments.....	2	24.5	3	3	441	
Wingwalls 1st portion	4	10	mean. 3.87	6.5	1,006.20	
„ 2nd „	4	area. 22.66		4.5	407.88	
„ 3rd „	4	area. 14.53		2	116.24	
Spandrels with backing.....	1	23.5	16	3	1,128	
Additional work on abutments...	4	2	.5	3	12	
Blocking Course.....	2	16	3.25	.5	52	
Additional work on abutment..	4	2	.5	3	12	
Parapet wall centre portion.....	2	12	2.5	4	240	
Portion of wall at both ends.....	4	mean. 11.90	mean. 2.87	5	683.06	
„ next to „	4	area. 36.22		mean. 3.5	507.08	4,605.46
Deduct Archway with arching..	1	23.5	area. 25.52		599.72	599.72

Solid feet coursed rubble stone and lime masonry.. 4,005.74

Concrete work.

	Number.	Length.	Breadth.	Depth.	SOLID FEET.
Over arch and abutments.....	1	16	17	.5	136
Solid feet concrete work...					136

Slabstone Arching.

Archring excepting face voussoirs.....

Number.	Length.	Breadth.	Depth.	SOLID FEET.
1	21	area. 11.79		247.59

Solid feet slabstone arching...

247.59

Cutstone work dressed, 3rd sort.

Voussoirs of arching.....

String Course at the foot of parapet wall.....

Coping over centre portion of parapet.....

„ on both sides of „

„ on wing walls

Number.	Length	Breadth.	Depth.	SOLID FEET.
2	11.79	1.25	1	29.47
2	65.84	5	5	32.12
2	12	area. 1.57		37.68
4	12.40	area. 1.99		98.70
4	17	area. 1.77		120.36

Solid feet cutstone work dressed, 3rd sort...

319.13

Choonam Plaster.

Bottom of aqueduct.....

Side of do. centre portion.....

Do. end.....

Number.	Length.	Breadth	SUPERFICIAL FEET.
1	16	17.5	280
2	12	4.25	102
4	mean. 11.90	5.25	249.90

Supl. feet choonam plaster..

631.90

Large rough stone Paving including Masonry Bedding.

Apron on both sides.....

Number.	Length.	Breadth.	SUPERFICIAL FEET.
2	19	5	190

Supl. feet large rough stone paving..

190

<i>Earthwork.</i>	Number.	Length.	Breadth.	Depth.	SOLID FEET.
Square portion between wingwalls..	2	16 75	10	4 5	1,507 5
Portion between wingwalls	2	11 75	27 25 mean	2	1,280 75
Embankment over do. for the sides of canals	4	11 75	10 17	5	2,436 95
Solid feet earthwork..					5,225 20

ABSTRACT.

		Rs.	a.	p.
2,681	Solid feet excavating foundation, at Rs. 0-12-0 per 100 solid feet	20	2	0
1,507	Solid feet filling in foundation with uncoursed rubble stone and lime, at Rs. 16 0-0 per 100 solid feet	241	1	11
4,006	Solid feet coursed rubble stone and lime masonry, at Rs. 20-0-0 per 100 solid feet	801	3	2
136	Solid feet concrete work, at Rs. 10 0 0 per 100 solid feet.	13	9	7
29	Solid feet arching of slabstone and lime, at Rs. 25-0-0 per 100 solid feet	7	4	0
319	Solid feet cutstone work dressed, 3rd sort, at Rs. 45-0 0 per 100 solid feet.. .. .	143	8	9
632	Supl feet choonam plaster at Rs. 6 0-0 per 100 supl. feet	37	14	8
110	Supl feet large roughstone paving, at Rs. 25-0-0 per 100 supl. feet	47	8	0
5,225	Solid feet earthwork, at Rs. 0-12-0 per 100 solid feet.. ..	39	3	0
1	Jungle wood centering, at Rs. 15 0-0 each.. .. .	15	0	0
Contingencies at 5 per cent.		1,366	7	1
		68	5	1
<i>Extra Establishment.</i>				
1	Carcoon for two months at Rs. 10 per month	20	0	0
1	Muccadum " at Rs. 8 "	16	0	0
Total Rs..		1,471	0	0
Add for one more..		1,471	0	0
Total Rs. .		2,942	0	0

AQUEDUCT No. 1.

GENERAL DESCRIPTION.

The aqueduct to consist of 6 segmental arches of 10 feet span, 2 feet rise, and one foot thick. The backing to arches over abutments and piers to be carried up to the blocking course, with a

layer of 6" of concrete to render the masonry water-tight. The piers to be 2 feet thick. Foundations of piers and abutments to be carried down 3 feet, in steps of one foot thick each, with 3 inch offsets. Spandril walls to be 3 feet thick. The wingwalls to be carried 20 feet into the banks of the nulla. Foundation in black soil. Aprons to be constructed on both sides 6 feet broad.

AQUEDUCT OF 6 ARCHES, EACH 10 FEET SPAN.

MEASUREMENTS.

Excavating Foundation.

	Number.	Length.	Breadth.	Depth.	SOLID FEET.
Abutment	2	24.75	5	mean 4	990
Wingwalls, 1st portion ...	4	4.5	4.5	mean 6.5	526.5
Do. 2nd do.	4	5	4.5	mean 4	360
Do. 3rd do.	4	area 27.23		4	435.68
Do. 4th do.	4	area 19.77		3.5	276.78
Piers	5	25.75	3.5	3	1,351.87
Apron on both sides	2	80	6	mean 1.5	1,680
Solid feet excavating foundation...					5,620.82

	Number.	Length.	Breadth.	Depth.	SOLID FEET.
<i>Filling in Foundation with Uncoursed Rubble Stone and Lime.</i>					
Abutments	2	mean 24.25	4.5	3	654.75
Wingwalls, 1st portion	4	mean 4.62	4.5	4	332.64
Do. 2nd do.	4	5	4.5	2	180
Do. 3rd do.	4	area 27.22		2	217.84
Do. 4th do.	4	19.77		1	79.08
Piers	5	mean 25.25	mean 3	3	1,136.25
Solid feet filling in foundation with uncoursed stone and lime...					2,600.56

SUPERSTRUCTURE.		Number	Length.	Breadth.	Height.	SOLID FEET.	SOLID FEET.
<i>Coursed Rubble Stone and Lime.</i>							
Abutments	2	23.25	mean 3.25	6	908.75		
Piers	5	22.25	2	6	1,335		
Starlings	10	2	mean .5	6	60		
Wingwalls, 1st portion	4	5.25	mean 3.87	8.5	690.79		
" 2nd "	4	5	3.87	6.5	503.10		
" 3rd "	4	area. 22.66		4.5	407.88		
" 4th "	4	area. 14.53		3	174.36		
Spandrils with backing	1	76	22.25	3	5,973		
Additional work on abutment ..	4	2	.5	3	12		
Parapet wall, centre portion	2	72	mean 2.5	4	1,440		
Portion of do. on both sides....	4	12.40	mean 2.87	5	711.76		
" next to "	4	area. 36.22		mean 3.5	507.03		
Additional work on abutment ..	4	2	.5	.5	2		
Blocking courses	2	76	3.25	.5	247		12,070.72
Deduct archway with arching ..	6	22.25	area. 25.52		3,406.92		3,406.92
Solid feet coursed rubble stone and lime masonry ..							8,663.80

		Number.	Length.	Breadth.	Depth.	SOLID FEET.
<i>Concrete work.</i>						
Over Arches, piers and abutments.....	1	76	15.75	.5	598.5	
Solid feet concrete work..						598.5

		Number.	Length.	Breadth.	Depth.	SOLID FEET.
<i>Slabstone Arching.</i>						
Arching excepting face voussoirs	6	19.75	area. 11.79			1397.11
Solid feet arching..						1397.11

	Number.	Length.	Breadth.	Depth.	SOLID FEET.
<i>Cutstone work, 3rd sort.</i>					
Voussoirs of archings	12	mean 11.79	mean 1.25	1	176.85
String course at the foot of parapet wall.. ..	2	126.84	.5	.5	63.42
Impost cornice of abutment and piers	1	320.30	.5	.5	80.07
Coping over centre portion of parapet	2	72	area 1.57		226.08
„ on both sides of „	4	12.00	area 1.99		102.08
„ „ wing walls	4	17.04	mean area 1.77		120.64
Solid feet cutstone work dressed, 3rd sort..					769.74

	Number.	Length.	Breadth.	SUPL. FEET.
<i>Chunam Plaster.</i>				
Bottom of aqueduct	1	76	16.25	1,235
Parapet wall, inside centre portion	2	72	4.25	612
„ end	4	mean 12.40	5.25	260.40
Supl. feet chunam plaster....				2,107.40

	Number.	Length.	Breadth.	SUPL. FEET.
<i>Large rough stone Paving including Masonry Bedding.</i>				
Apron on both sides	2	80	6	960
Supl. feet large rough stone paving..				960

Earthwork.

	Number.	Length.	Breadth.	Depth.	SOLID FEET.
Square portion between wingwalls	2	mean 16	mean 10.25	5.5	1,804
Portion between wingwalls	2	11.75	mean 26	mean 2	1,222
Embankments over do. for the sides of canal.	4	11.75	mean 10.37	5	2,436.95
Solid feet earthwork..					5,462.95

Starling Caps of cutstone, 3rd sort.

	Number.	Length.	Breadth.	Height.	NUMBER.
Starling caps	10	2	1	1	20
No. of starling caps..					20

ABSTRACT.

5621	Solid feet excavating foundation in black soil, at Rs. 0-12-0 per 100 feet	42	2	6
2601	Solid feet filling in do. with uncoursed rubble stone and lime, at Rs. 16-0-0 per 100 feet.. .. .	416	2	6
8664	Solid feet coursed rubble stone and lime masonry, at Rupees 20-0-0 per 100 feet.. .. .	1,732	12	9
598	Solid feet concrete work, at Rs. 10-0-0 per 100 feet.. .. .	59	12	9
1397	Solid feet arching of slabstone and lime, at Rs. 25-0-0 per 100 ft.	349	4	0
770	Solid feet cutstone work dressed, 3rd sort, at Rs. 45-0-0 per 100 ft	346	8	0
2107	Superficial feet chunam plaster at Rs. 6-0-0 per 10 feet	126	6	8
960	Superficial feet large rough stone paving, at Rs. 25-0-0 per 100 ft	240	0	0
5463	Solid feet earthwork, at Rs. 0-12-0 per 100 feet	40	15	6
20	Nos. of starling caps, at Rs. 4-0-0 each.. .. .	80	0	0
3	Nos. of jungle wood centering at Rs. 15-0-0 each	45	0	0
		3,479	0	8
Contingencies at 5 per cent		173	15	2
EXTRA ESTABLISHMENT.				
1	Carcoon for 3 months, at Rs. 10 per month	30	0	0
1	Muccadum do. at Rs. 8 do.	24	0	0
Total Rs...		3,707	0	0

AQUEDUCT No. 4.

GENERAL DESCRIPTION.

The aqueduct to consist of one segmental arch of 10 feet span, $16\frac{1}{4}$ feet breadth at bottom, 2 feet rise, and one foot thick. Backing to arches over abutments and piers to be carried up to the blocking course, with a layer of 6" of concrete on top to render the masonry watertight. Foundation of abutment to be carried down 3 feet in steps of 1 foot thick each, with 3" offsets. Spandril walls to be 3 feet thick. Wing walls to be carried 20 feet into the banks of the nulla. Embankment to be raised in one foot layer, watered and rammed. Aprons to be constructed on both sides of aqueduct, 5 feet broad between arches.

AQUEDUCT OF ONE ARCH, 10 FEET SPAN, BETWEEN THE 2ND AND 4TH MILES.

MEASUREMENTS.

	Number.	Length.	Breadth.	Depth.	SOLID FEET.
<i>Excavating Foundation.</i>					
Abutment.....	2	24.75	4.5	mean. 3	668.25
Wing walls, 1st portion	4	9.5	4.5	5	855
„ 2nd „	4	area. 27.23		4.75	517.37
„ 3rd „	4	area. 19.77		3.5	276.78
Apron on both sides.....	2	19	5	mean 1.75	332.5
Solid feet excavating foundation..					2,649.90

	Number.	Length.	Breadth.	Depth.	SOLID FEET.
<i>Filling in Foundation with uncoursed Rubble Stone and Lime Masonry.</i>					
Abutment.....	2	mean. 24.25	4	3	582
Wing walls, 1st portion ..	4	mean. 9.62	4.5	3	599.48
„ 2nd „	4	area. 27.23		2	217.84
„ 3rd „	4	area. 19.77		2	158.16
Solid feet filling in foundation with uncoursed rubble stone and lime..					1,477.48

	Number.	Length.	Breadth.	Height.	SOLID FEET.	SOLID FEET.
<i>Superstructure.</i>						
<i>Coarsed Rubble Stone and Lime Masonry.</i>						
Abutments.....	2	23-25	3 mean.	3	418	
Wing walls, 1st portion	4	10	3-87	6-5	1,006-20	
„ 2nd „	4	area. 22-66		4-5	407-88	
„ 3rd „	4	area. 14-53		2	116-24	
Spandrils with backing.....	1	22-25	16	3	1,068	
Additional work on abutments...	4	2	.5	3	12	
Blocking courses.....	2	16	3-25	.5	52	
Additional work on abutments...	4	2	.5	3	12	
Parapet wall, centre portion.....	2	12	2-5	4	240	
Portion of do. at both ends..	4	mean. 11-10	mean. 2-87	5	683-06	
„ next „ ..	4	area. 36-22		area. 3-5	507-08	4,522-06
Deduct Archway with arching..	1	22-25	area. 25-52		567-82	567-82
Solid feet coursed rubble stone and lime masonry..						3,955-14

	Number.	Length.	Breadth.	Depth.	SOLID FEET.
<i>Concrete work.</i>					
Over arch and abutment.....	1	16	15-75	.5	126
Solid feet concrete work...					126

	Number.	Length.	Breadth.	Depth.	SOLID FEET.
<i>Slabstone Arching.</i>					
Arching excepting face voussoirs.....	1	19-75	area. 11-79		232-85
Solid feet slab stone arching..					232-85

	Number.	Length	Breadth.	Depth.	SOLID FEET.
<i>Cutstone work.</i>					
Voussoirs of arching.....	2	area 11.79	1.25	1	29.47
String course at the foot of parapet wall.....	2	65.84	.5	5	32.92
Coping over centre portion of „	2	12	area 1.57		37.68
„ on both sides of „	4	12.40	area 1.99		98.70
„ wing walls.....	4	17	area 1.77		120.36
Solid feet cutstone work, 3rd sort..					319.13

	Number.	Length.	Breadth.	SUPERFICIAL FEET.
<i>Chunam Plaster.</i>				
Bottom of aqueduct.....	1	16	16.25	260
Sides of „ centre portion.....	2	12	4.25	102
Do. „ ends.....	4	11.90	5.25	249.90
Supl. feet chunam plaster..				611.90

	Number.	Length.	Breadth.	SUPERFICIAL FEET.
<i>Large Stone Paving.</i>				
Apron on both sides.....	2	19	5	190
Supl. feet large rough stone paving..				190

	Number.	Length.	Breadth.	Depth.	SOLID FEET.
<i>Earthwork.</i>					
Square portion between wing walls.....	2	mean. 15.5	10	mean 4.5	13.95
Portion between wing walls.....	2	11.75	mean. 26	2	12.22
Embankment over do. for the sides of canal....	4	11.75	mean. 10.37	5	2,436.39
Solid feet earthwork..					5,053.39

ABSTRACT.

2,650	Solid feet excavating foundation, at Rs. 0-12-0 per 100 solid feet.. .. .	19	14	0
1,477	Solid feet filling in foundation with uncoursed rubble stone and lime masonry, at Rs. 16-0-0 per 100 solid feet.. .. .	236	5	1
3,955	Solid feet coursed rubble stone and lime masonry, at Rs. 20-0-0 per 100 solid feet.. .. .	791	0	0
126	Solid feet concrete work, at Rs. 10-0-0 per 100 solid feet.. .. .	12	9	7
232	Solid feet arching of slabstone and lime, at Rs. 25-0-0 per 100 solid feet.. .. .	58	4	0
319	Solid feet cutstone work dressed, 3rd sort, at Rs. 45-0-0 per 100 solid feet.. .. .	143	8	9
612	Superficial feet chunam plaster, at Rs. 6-0-0 per 100 superficial feet.....	36	11	6
190	Superficial feet large rough stone paving, at Rs. 25-0-0 per 100 superficial feet.. .. .	47	8	0
5,053	Solid feet earthwork, at Rs. 0-12-0 per 100 solid feet.. .. .	37	14	4
1	Jungle wood centering, at Rs. 15-0-0 each.. .. .	15	0	0
		1,398	11	3
Contingencies at 5 per cent... .. .		69	14	4
EXTRA ESTABLISHMENT.				
1	Carcoon for 2 months, at Rs. 10 ⁰ per month.. .. .	20	0	0
1	Muccadam do. at Rs. 8 do.	16	0	0
		36	0	0
Total Rs..		1,485	0	0
Add for two more..		2,970	0	0
Total for three...		4,455	0	0

AQUEDUCT No. 4.

GENERAL DESCRIPTION.

The aqueduct to consist of one segmental arch of 10 feet span, 15 feet breadth at bottom, 2 feet rise, and one foot thick. Backing to arches over abutments and piers to be carried up to the blocking course, with a layer of 6" of concrete on top to render the masonry watertight. Foundations of abutments to be carried down three feet in steps of one foot thick each, with 3" offsets. Spandrill walls to be 3 feet thick. Wing walls to be carried 20 feet into the banks of the nulla. Embankment to be raised in one foot layer, watered and rammed. Aprons to be constructed on both sides of aqueduct, 5 feet broad, between arches.

AQUEDUCT OF ONE ARCH 10 FEET SPAN BETWEEN 6TH AND 9TH MILES.

MEASUREMENTS.

	Number.	Length	Breadth.	Depth	SOLID FEET.
<i>Excavating Foundation.</i>					
Abutments	2	23 5	4 5	mean 3	634 5
Wing walls, 1st portion	4	9 5	1 5	5	855
" 2nd " 	4	area 27 13		4 75	517 37
" 3rd " 	4	area 19 77		3 5	276 78
Apron on both sides	2	19	5	mean 1 75	232 5
Solid feet excavating foundation..					2,616 15

	Number	Length	Breadth	Depth	SOLID FEET
<i>Filling in Foundation.</i>					
Abutments	2	mean 23	4	3	552
Wing walls, 1st portion	4	mean 9 62	4 5	3	515 18
" 2nd " 	4	area 27 13		2	217 84
" 3rd " 	4	area 11 77		2	108 16
Solid feet filling in foundation.					1 447 48

SUPERSTRUCTURE.					SOLID FEET.	SOLID FEET.
<i>Coursed Rubble Stone and Lime Masonry.</i>						
Abutment	2	22	3 mean	3	396	
Wings walls, 1st portion	4	10	3·87	6·5	1,006·20	
„ 2nd „	4	area 22·66		4·5	407·88	
„ 3rd „	4	area 14·53		2	116·24	
Spandrils with backing	1	21	16	3	1,008	
Additional work on abutments ..	4	2	·5	3	12	
Blocking course	2	16	3·25	·5	52	
Additional work on abutments ..	4	2	·5	3	12	
Parapet walls, centre portion ..	2	12	2·5	3·5	210	
Portions of „ at both ends...	4	mean 11·90	mean 2·87	5	683·05	
„ next „ ..	4	area 36·22	area 3·5		507·08	4,410·45
Deduct archway with arching ..	1	21	area 25·52		535·92	535·92
Solid feet coursed rubble stone and lime masonry...						3874·53

<i>Concrete Work.</i>					SOLID FEET.
Number.	Length.	Breadth.	Depth.		
Over arch and abutments	1	16	14·5	·5	116
Solid feet concrete work..					116

<i>Slabstone Arching.</i>					SOLID FEET.
Number.	Length.	Breadth.	Depth.		
Archring excepting face voussoirs	1	1·85	area 11·79		218·11
Solid feet slabstone arching..					218·11

Cutstone work, 3rd sort.

	Number.	Length.	Breadth.	Depth.	SOLID FEET.
Voussoirs of arching	2	area 11.79	1.25	1	29.47
String course at the foot of parapet walls	2	65.84	.5	.5	32.92
Coping over centre portion of „	2	12	area 1.57		37.68
„ on both sides of „	4	12.40	area 1.99		98.70
„ wing walls	4	17	area 1.77		120.36
Solid feet cutstone work dressed, 3rd sort...					319.13

Chunam Plaster.

	Number.	Length.	Breadth.	SUPL. FEET.
Bottom of aqueduct	1	16	15	240
Sides of „ centre portion	2	12	3.75	90
„ ends	4	mean 11.90	5.25	249.90
Supl. feet Chunam plaster..				579.90

Large rough Stone Paving.

	Number.	Length.	Breadth.	SUPL. FEET.
Apron on both sides	2	19	5	190
Supl. feet large rough stone paving...				190

	Number.	Length.	Breadth.	Depth.	SOLID FEET.
<i>Earthwork.</i>					
Square portion between wing walls	2	14.25	10 mean	4.5	1,282.5
Portion between wing walls	2	11.75	24.75 mean	2	1,163.25
Embankments over do. for the sides of canals.	4	11.75	10.37	5	2,436.95
Solid feet earthwork..					4,882.70

ABSTRACT.

2616	Solid feet excavating foundation, at Rs. 0-12-0 per 100 solid feet	19	9	11
1447	Solid feet filling in do. with uncoursed rubble stone and lime, at Rs. 16-0-0 per 100 solid feet	231	8	3
3875	Solid feet coursed rubble stone and lime masonry, at Rupees 20-0-0 per 100 solid feet.. .. .	775	0	0
116	Solid feet concrete work, at Rs. 10-0-0 per 100 solid feet.. ..	11	9	7
218	Solid feet arching of slabstone and lime, at Rs. 25-0-0 per 100 solid feet.. .. .	54	8	0
319	Solid feet cutstone work dressed, 3rd sort, at Rs. 45-0-0 per 100 solid feet	143	8	9
580	Superficial feet chunam plaster, at Rs. 6-0-0 per 100 suppl. feet..	34	12	9
190	Superficial feet large rough stone paving, at Rs. 25-0-0 per 100 suppl. feet	47	8	0
4883	Solid feet earthwork, at Rs. 0-12-0 per 100 solid feet.	36	9	11
1	Jungle wood centring, at Rs. 15-0-0 per each	15	0	0
		1369	11	2
Add contingencies at 5 per cent		68	7	9
EXTRA ESTABLISHMENT.				
1	Carcoon for 2 months, at Rs. 10 per month	20	0	0
1	Muccadam do. at Rs. 8 do.	16	0	0
		36	0	0
Total Rs..		1,474	0	0
Add for three more..		4,422	0	0
Total for four..		5,896	0	0

AQUEDUCT No. 3.

GENERAL DESCRIPTION.

The aqueduct to consist of 2 segmental arches of 10 feet span and 2 feet rise, and 1 foot thick. The backing to arches over abutments and piers to be carried up to the blocking course, with a layer of 6" of concrete to render the masonry watertight. The

piers to be 2 feet thick ; foundations of piers and abutments to be carried down three feet, in steps of one foot thick each, with three-inch offsets. Spandril walls to be 3 feet thick. The wing walls to be carried $15\frac{1}{2}$ feet into the banks of the nulla. The foundations of this bridge is in moorum. Aprons to be constructed on both sides, 5.5 feet broad between arches.

AQUEDUCT OF TWO ARCHES 10 FEET SPAN.

MEASUREMENTS.

	Number.	Length.	Breadth.	Depth.	SOLID FEET.
<i>Excavating Foundation.</i>					
Abutments.....	2	23.5	4.5	mean 3	634.5
Wing walls, 1st portion.....	4	5	4.5	mean 4.5	405
Ditto 2nd ditto.....	4	area. 27.23		4.5	490.14
Ditto 3rd ditto.....	4	area. 19.77		4	316.32
Piers.....	1	22.5	3.5	3 mean 1.75	236.25
Apron on both sides.....	2	31	5.5		596.75
Solid feet excavating foundation....					2,678.96

	Number.	Length.	Breadth.	Depth.	SOLID FEET.
<i>Filling in Foundation with uncoursed Rubble Stone and Lime Masonry.</i>					
Abutments.....	2	mean. 23	4	3	552
Wing walls, 1st portion.....	4	mean. 5.12	4.5	2	184.32
Ditto 2nd ditto.....	4	area 27.23		3.5	381.22
Ditto 3rd ditto.....	4	area 19.77		2	158.16
Pier.....	1	22	3	3	198
Solid feet filling in foundation with uncoursed stone and lime..					1,472.70

SUPERSTRUCTURE.					SOLID FEET.	SOLID FEET.
<i>Coursed Rubble Stone and Lime Masonry.</i>						
Abutments.....	2	22	2.75	4	484	
Piers.....	1	21	2	4	168	
		mean.	mean.			
Wing walls, 1st portion.....	4	5.96	3.87	8.5	784.21	
		area.				
Ditto 2nd ditto.....	4	22.66		5	453.20	
		area.				
Ditto 3rd ditto.....	4	14.53		3	174.36	
Spandrils with backing.....	1	26.56	21	3	1,673.28	
Additional work on abutments...	4	1.07	.5	3	6.42	
		mean.				
Blocking course.....	2	26.18	3.25	.5	85.08	
Additional work on abutments...	4	1.07	.5	.5	1.07	
		mean.				
Parapet wall, centre portion...	2	24	2.5	3.5	420	
		mean.	mean.			
Portion of centre at both ends...	4	7.40	2.87	5	424.76	
		area.				
„ next to „	4	36.22		3.5	507.08	5,181.46
		area.				
Deduct archway with arching ..	2	21	25.52		1,071.84	1,071.84
Solid feet coursed rubble stone and lime masonry						4,109.62

	Number.	Length.	Breadth.	Depth.	SOLID FEET.
<i>Concrete Work.</i>					
Over arches, piers and abutments	1	26.18	14.5	.5	189.80
Solid feet concrete work.....					189.80

	Number.	Length.	Breadth.	Depth.	SOLID FEET.
<i>Slab Stone Arching.</i>					
Arching excepting face voussoirs... ..	2	18.5	area. 11.79		436.23
Solid feet slabstone arching.....					436.23

Cutstone Work, 3rd Sort

	Number.	Length.	Breadth.	Depth.	SOLID FEET.
Voussoirs of arching	4	mean 11.79	mean 1.25	1	58.95
String course at the foot of parapet wall.....	2	68.84	.5	.5	34.42
Coping over centre portion of parapet	2	24	area 1.57		75.36
Ditto on both sides of parapet.....	4	mean 7.90	area 1.99		62.88
Ditto on wing walls	4	17	area 1.77		122.36
Solid feet cutstone work dressed, 3rd sort.....					353.77

Chunam Plaster.

	Number.	Length.	Breadth	SUPL. FEET.
Bottom of aqueduct.....	1	26.12	15	391.80
Sides of centre portion	2	24	4.25	204
Ditto end	4	mean 7.40	5.25	155.40
Superficial feet chunam plaster....				751.20

Large rough Stone Paving including Masonry Bedding.

	Number.	Length.	Breadth.	SUPL. FEET.
Apron on both sides.....	2	31	5.5	341
Superficial feet large rough stone paving....				341

	Number.	Length.	Breadth.	Depth.	SOLID FEET.
<i>Earthwork.</i>					
Square portion between wingwalls.....	2	mean 14.25	5.66 mean	mean 6.5	1104.09
Portion between wingwalls.....	2	11.75	24.75 mean	2.75	1599.46
Embankment over do. for the sides of Canals.	4	11.75	10.37 mean	5	2436.96
Solid feet earthwork.....					5140.5

ABSTRACT.

2679	Solid feet excavating foundation, at Rs. 1-0-0 per 100 solid feet..	26	12	7
1474	Solid feet filling in do. with uncoursed rubble stone and lime, at Rs. 16 0-0 per 100 solid feet ..	235	13	5
4110	Solid feet coursed rubble stone and lime masonry, at Rs. 20-0-0 per 100 solid feet ..	822	0	0
190	Solid feet concrete work at Rs. 10-0-0 per 100 solid feet..	19	0	0
436	Solid feet arching of slabstone and lime, at Rs. 25-0-0 per 100 solid feet ..	109	0	0
354	Solid feet cutstone work dressed, 3rd sort, at Rs. 45-0-0 per 100 solid feet ..	159	4	9
751	Superficial feet chunam plaster at Rs. 6-0-0 per 100 suppl. feet..	45	0	11
341	Superficial feet large rough stone paving, at Rs. 25-0-0 per 100 superficial feet ..	85	4	9
5140	Solid feet earthwork, at Rs. 0-12-0 per 100 solid feet ..	38	8	9
2	No. of jungle-wood centreings, at Rs. 15-0-0 per each ..	30	0	0

Contingencies at 5 per cent	1570	12	5
	78	8	7

EXTRA ESTABLISHMENT.

1 Carroon for 3 months, at Rs. 10 per month...	30	0	0
1 Muccadam ditto at Rs. 8 per month...	24	0	0
Total Rs.....	54	0	0
	1703	0	0

AQUEDUCT No. 4.

GENERAL DESCRIPTION.

The aqueduct to consist of one segmental arch of 10 feet span, 13 $\frac{3}{4}$ feet breadth at bottom, 2 feet rise, and one foot thick. Backing to arches over abutments and piers to be carried up to the locking course, with a layer of 6" of concrete on top to render the

masonry water-tight. Foundation of abutments to be carried down three feet, in steps of one foot thick each, with 3 inch offsets. Spandril walls to be 3 feet thick. Wingwalls to be carried 20 feet into the banks of the nulla. Embankments to be raised in one foot layer watered and rammed. Aprons to be constructed on both sides of aqueduct, 5 feet broad between arches.

AQUEDUCT OF ONE ARCH 10 FEET SPAN BETWEEN 9TH AND 13TH MILES.

MEASUREMENTS.					
	Number.	Length.	Breadth.	Depth.	SOLID FEET.
<i>Excavating Foundation.</i>					
Abutment	2	22-25	4-5	mean 3	600-75
Wingwalls, 1st portion	4	9-5	4-5	5	855
Do. 2nd do.	4	area 27-23		4-75	517-37
Do. 3rd do.	4	area 19-77		3-5	276-78
Apron on both sides	2	19	5	mean 1-75	332-5
Solid feet excavating foundation...					2,582-40

<i>Filling in Foundation.</i>					SOLID FEET.
	Number.	Length.	Breadth.	Depth.	
Abutments.....	2	mean. 21·75	4	3	522
Wingwalls, 1st portion.....	4	mean. 9·62	4·5	3	519·48
„ 2nd „	4	area. 27·23		2	217·84
„ 3rd „	4	area. 19·77		2	158·16
Solid feet filling in foundation..					1,417·48

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					SOLID FEET.	SOLID FEET.
<i>Superstructure. Coursed Rubble Stone and Lime.</i>						
Number.	Length.	Breadth.	Height.			
Abutment	2	20.75	3	3	373.5	
Wing walls, 1st portion	4	10	mean. 3.87	6.5	1,006.20	
„ 2nd „	4	area. 22.66		4.5	407.88	
„ 3rd „	4	area. 14.53		2	116.24	
Spandrils with backing.....	1	19.75	16	3	948	
Additional work on abutment. ..	4	2	.5	3	12	
Blocking courses	2	16	3.25	.5	52	
Additional work on abutment...	4	2	.5	3	12	
Parapet walls centre portion.....	2	12	2.5	3.5	219	
Portion of walls at both ends.....	4	11.90	2.87	5	683.06	
„ next to „	4	area. 36.22		3.5	507.58	4,824.64
Deduct arching with archring..	1	19.75	area. 25.52		504.02	504.02
Solid feet coursed rubble stone and lime ..						3,824.62

					SOLID FEET.
<i>Concrete work.</i>					
Number.	Length.	Breadth.	Depth.		
Over arch and abutment	1	16	13.25	.5	106
Solid feet concrete work...					106

					SOLID FEET.
<i>Slabstone Arching.</i>					
Number.	Length.	Breadth.	Depth.		
Arching excepting face voussoirs.....	1	17.25	area. 11.79		203.37
Solid feet slabstone arching...					203.37

Cutstone Work.

	Number.	Length	Breadth.	Depth.	SOLID FEET.
Voussoirs of arching.....	2	area 11-79	1-25	1	29-17
String course at the foot of parapet walls.....	2	65-84	5	5	32-92
Coping over centre portion of „	2	12	area. 1-57		37-68
„ on both sides of „	4	12-10	area. 1-99		98-70
„ on wing walls	4	17	mean area. 1-77		120-36

Solid feet cutstone work dressed, 3rd sort... 319-13

Chunam Plaster.

	Number.	Length.	Breadth.	SUPERFICIAL FEET.
Bottom of aqueduct.....	1	16	13-75	220
Sides of do., centre portion.....	2	12	3-75	90
Do. ends.....	4	mean. 11-90	5-25	249-90
Supl. feet chunam plaster..				559-90

Large rough Stone Paving.

	Number.	Length.	Breadth.	SUPERFICIAL FEET.
Apron on both sides.....	2	19	5	190
Supl. feet large rough stone paving..				190

<i>Earthwork.</i>	Number.	Length.	Breadth.	Depth	SOLID FEET.
Square portion between wing walls..	2	13	10	4.5	1,170
Portion between wing walls.....	2	11.75	mean. 23.5	2	1,104.5
Embankment over do. for the sides of canals.....	4	11.75	10.37	5	2,436.95
Solid feet earthwork..					4,711.45

ABSTRACT.

		Rs.	a.	p.
2,582	Solid feet excavating foundation, at Rs. 0-12-0 per 100 solid feet..	19	5	10
1,417	Solid feet filling in foundation, with uncoursed rubble stone and lime, at Rs. 16-0-0 per 100 solid feet ..	226	11	6
3,825	Solid feet coursed rubble stone and lime masonry, at Rs. 20-0-0 per 100 solid feet ..	76	8	0
106	Solid feet concrete work, at Rs. 10-0-0 per 100 solid feet.	10	9	7
203	Solid feet arching of slabstone and lime, at Rs. 25-0-0 per 100 solid feet ..	50	12	0
319	Solid feet cutstone work dressed, 3rd sort, at Rs. 45-0-0 per 100 solid feet..	143	8	9
560	Supl. feet chunam plaster, at Rs. 6-0-0 per 100 solid feet ..	33	9	7
190	Supl. feet large roughstone paving, at Rs. 25-0-0 per 100 solid. feet ..	47	8	0
4,711	Solid feet earthwork, at Rs. 0-12-0 per 100 solid feet..	35	5	3
1	Jungle wood centreing, at Rs. 15-0-0 each..	15	0	0
		658	14	6
Contingencies at 5 per cent. ..		32	15	1
<i>Extra Establishment.</i>				
1	Carcoon for two months at Rs. 10 per month ..	20	0	0
1	Muccadum " at Rs. 8 " ..	16	0	0
Total Rs..		728	0	0
Add for one more..		728	0	0
Total for two..		1,456	0	0

AQUEDUCT No. 2.

GENERAL DESCRIPTION.

The aqueduct to consist of four segmental arches of 10 feet span, each 2 feet rise, and one foot thick. The abutments to be $2\frac{3}{4}$ feet thick; backing to arches over abutments and piers to be carried up

to the blocking course, with 6" of concrete on top to render the masonry watertight. Piers to be 2 feet thick. Foundations of piers and abutments to be carried down 3 feet in steps of one foot thick, each with 3" offsets. The spandril wall to be three feet thick. The wing walls to be carried 20 feet into the banks of the nulla; foundation to be in moorum. Aprons to be constructed on both sides, 5 feet broad, between arches.

AQUEDUCT OF FOUR ARCHES EACH 10 FEET SPAN.

MEASUREMENTS.

<i>Excavating Foundation.</i>					SOLID FEET.
	Number.	Length.	Breadth.	Depth.	
Abutments.....	2	22.25	4.5	mean. 3	600.75
Wing walls, 1st portion	4	9.5	4.5	4	684
„ 2nd „	4	area. 27.23		4	435.68
„ 3rd „	4	area. 19.77		4.25	326.09
Pier	3	23.25	3.5	3	732.37
Apron on both sides	2	55	5	mean 1.75	962.5
Solid feet excavating foundation .					3,751.39

<i>Filling in Foundation with uncoursed Rubble Stone • and Lime Masonry.</i>					SOLID FEET.
	Number.	Length.	Breadth.	Depth.	
Abutment.....	2	21.75	4	3	522
Wing walls, 1st portion	4	mean. 9.62	4.5	2	346.32
„ 2nd „	4	area. 27.23		2	217.84
„ 3rd „	4	area. 19.77		2	158.16
Piers.	3	mean. 22.75	3	3	614.25
Solid feet filling in foundation..					1,858.57

	Number.	Length.	Breadth.	Height.	SOLID FEET.	SOLID FEET.
<i>Superstructure. Coursed Stone and Lime.</i>						
Abutments.....	2	20.75	mean. 2.75	3	342.37	
Piers.....	3	19.75	2	3	355.5	
Starlings.....	6	.2	.5	3	18	
		mean.	mean.			
Wing walls, 1st portion.....	4	10.54	3.87	7.5	1,223.69	
		area.				
„ 2nd „	4	22.66		5.5	498.52	
		area.				
„ 3rd „	4	14.53		3.5	203.42	
		mean.				
Spandrils with backing.....	1	50.41	19.75	3	2986.79	
Additional work on abutments..	4	0.91	.5	3	5.46	
		mean.				
Blocking courses.....	2	49.91	3.25	.5	162.20	
Additional work on abutments..	4	.91	.5	.5	.91	
		mean.				
Parapet wall, centre portion.....	2	48	2.5	4	960	
		mean.	mean.			
Portion of do. at both ends..	4	11.90	2.87	5	683.06	
		area.				
„ next „ ..	4	36.22		3.5	507.08	7,947
		area.				
Deduct archway with archring..	4	19.75	25.52		2,016.08	2,016.08
Solid feet coursed rubble stone and lime masonry ..						9,530.92

	Number.	Length.	Breadth.	Depth.	SOLID FEET.
<i>Concrete work.</i>					
Over arches, piers and abutments....	1	49.91	13.25	.5	330.65
Solid feet concrete work...					330.65

	Number.	Length.	Breadth.	Depth.	SOLID FEET.
<i>Slabstone Arching.</i>					
Arching excepting face voussoirs.....	4	17.25	area. 11.79		813.51
Solid feet slabstone arching..					813.51

Cutstone work, dressed, 3rd sort.

	Number.	Length.	Breadth.	Depth.	SOLID FEET.
Voussairs of arching.....	8	area. 11·79	1·25	1	117·90
String course at the foot of parapet walls.....	2	101·84	·5	·5	50·92
Impost cornice of abutment and pier.....	1	193·18	·5	·5	48·29
Coping over centre portion of parapet.....	2	48	area 1·57		150·72
„ on both sides of „	4	12·40	area 1·99		98·70
„ on wing walls.....	4	17	area 1·77		120·36
Solid feet cutstone work, dressed, 3rd sort..					586·89

Chunam Plaster.

	Number.	Length.	Breadth.	SUPERFICIAL FEET.
Bottom of aqueduct.....	1	49·83	13·75	685·16
Parapet wall inside, centre portion.....	2	48	4·25	408
Do. „ end.....	4	mean 11·90	5·25	249·90
Supl. feet chunam plaster..				1343·06

Large rough Stone Paving.

	Number.	Length.	Breadth.	SUPERFICIAL FEET.
Apron on both sides.....	2	55	5	550
Supl. feet large rough stone paving..				550

Earthwork.

	Number.	Length.	Breadth.	Depth.	SOLID FEET
Square portion between wing walls.....	2	mean. 13	mean. 10·54	mean. 5·5	1,507·22
Portion between wing walls.....	2	11·75	mean. 23·5	mean. 2·25	1,242·56
Embankment over do. for the sides of canal....	4	11·75	mean. 10·37	5	2,436·95
Solid feet earthwork..					5,186·73

	Number.	Length.	Breadth.	Height.	Number.
<i>Starling Caps.</i>					
Starling caps	6	2	1	1	6
Number of Starling Caps...					6

ABSTRACT.

3,751	Solid feet excavating foundation, at Rs. 1-0-0 per 100 solid feet.. .. .	37	8	1
1,859	Solid feet filling in foundation with uncoursed rubble stone and lime masonry, at Rs. 16-0-0 per 100 solid feet.. .. .	297	7	0
5,931	Solid feet coursed rubble stone and lime masonry, at Rs. 20-0-0 per 100 solid feet.. .. .	1,186	3	2
331	Solid feet concrete work, at Rs. 10-0-0 per 100 solid feet.. .. .	33	1	7
814	Solid feet arching of slabstone and lime, at Rs. 25-0-0 per 100 solid feet... .. .	203	8	0
587	Solid feet cutstone work dressed, 3rd sort, at Rs. 45-0-0 per 100 solid feet.. .. .	264	2	4
1,343	Superficial feet chunam plaster, at Rs. 6-0-0 per 100 superficial feet..... .. .	80	9	3
550	Superficial feet large rough stone paving, at Rs. 25-0-0 per 100 superficial feet.. .. .	137	8	0
5,187	Solid feet earthwork, at Rs 0-12-0 per 100 solid feet.. .. .	38	14	5
6	Number of starling caps, at Rs. 3-0-0 each.. .. .	18	0	0
2	Number of junglewood centering, at Rs. 15-0-0 each	30	0	0
		2,326	13	10
Contingencies at 5 per cent... .. .		116	5	5
EXTRA ESTABLISHMENT.				
1	Carcoon for 6 months, at Rs. 10 per month.. .. .	60	0	0
1	Muccadum do. at Rs. 8 do.	48	0	0
Total Rs..		2,551	0	0

AQUEDUCT No. 4. GENERAL DESCRIPTION.

The aqueduct to consist of one segmental arch of 10 feet span, 12½ feet breadth at bottom, 2 feet rise, and one foot thick. Backing to arches over abutments and piers to be carried up to the blocking course, with a layer of 6" of concrete on top to render the masonry watertight. Foundation of abutment to be carried down 3 feet in steps of 1 foot thick each, with 3" offsets. Spandril walls to be 3 feet thick. Wing walls to be carried 20 feet into the banks of the nulla. Embankments to be raised in one foot layer, watered and rammed. Aprons to be constructed on both sides of aqueduct, 5 feet broad between arches.

AQUEDUCT OF ONE ARCH, 10 FEET SPAN, BETWEEN THE 14TH AND 15TH MILES. MEASUREMENTS.

	Number.	Length.	Breadth.	Depth.	SOLID FEET.
<i>Excavating Foundation.</i>					
Abutments.....	2	21	4.5	mean. 3	567
Wing walls, 1st portion	4	9.5	4.5	3	855
" 2nd " 	4	area. 27.23		4.7	517.37
" 3rd " 	4	area. 19.77		3.5	276.78
Apron on both sides.....	2	19	5	mean 1.75	332.5
Solid feet excavating foundation...					2,548.65

	Number.	Length.	Breadth.	Depth.	SOLID FEET.
<i>Filling in Foundation</i>					
Abutment	2	mean 20.5	4	3	492
Wing walls, 1st portion	4	9.62	4.5	3	519.48
Do. 2nd do.	4	area. 27.23		2	217.84
Do. 3rd do.	4	area. 19.77		2	158.16
Solid feet filling in foundation...					1,387.48

	Number.	Length.	Breadth.	Height.	SOLID FEET.	SOLID FEET.
SUPERSTRUCTURE.						
<i>Coursed Rubble Stone and Lime Masonry.</i>						
Abutment	2	19.5	3	3	351	
Wings walls, 1st portion	4	10	mean 3.87	6.5	1,006.20	
„ 2nd „	4		area 22.66	4.5	407.88	
„ 3rd „	4		area 14.53	2	116.24	
Spandril with backing	1	18.5	16	3	888	
Additional work on abutment ..	4	2	.5	3	12	
Blocking course	2	16	3.25	.5	52	
Additional work on abutment ...	4	2	.5	3	12	
Parapet wall, centre portion.. ..	2	12	2.5	3.5	210	
Portion of do. at both ends.. ..	4	11.90	2.87	5	683.06	
„ next. „ ..	4		area 36.22	3.5	507.08	3,855.46
Deduct archway with arching ..	1	18.5	area 25.52		480.37	480.37
• Solid feet coursed rubble stone and lime masonry...						3375.09

	Number.	Length.	Breadth.	Depth.	SOLID FEET.
<i>Concrete Work.</i>					
Over arch and abutment	1	16	12	.5	96
Solid feet concrete work..					96

	Number.	Length.	Breadth.	Depth.	SOLID FEET.
<i>Slabstone Arching.</i>					
Arching excepting face voussoirs	1	16	area 11.79		188.64
Solid feet slabstone arching..					188.64

Cutstone work dressed, 3rd sort.

	Number.	Length.	Breadth.	Depth.	SOLID FEET.
Voussoirs of arching	2	11.79	1.25	1	29.47
String course at the foot of parapet walls	2	65.84	.5	.5	32.92
Coping over centre portion of „	2	12	area 1.57		37.68
„ on both sides of „	4	12.40	area 1.99		98.70
„ wing walls	4	17	area 1.77		120.36
Solid feet cutstone work dressed, 3rd sort...					319.13

Chunam Plaster.

	Number.	Length.	Breadth.	SUPL. FEET
Bottom of aqueduct	1	16	12.5	207.20
Sides of „ do. centre portion	2	12	3.75	90
„ ends	4	11.90	5.25	249.90
Supl. feet Chunam plaster..				547.10

Large Rough Stone Paving.

	Number.	Length.	Breadth.	SUPL. FEET
Apron on both sides	2	19	5	190
Supl. feet large rough stone paving...				190

Earthwork.

	Number.	Length.	Breadth.	Depth.	SOLID FEET.
Square portion between wing walls	2	11.75	10	4.5	1,057.5
Portion between wing walls	2	11.75	22.25	2	1,045.75
Embankment over do. for the sides of canal..	4	11.75	10.37	5	2,436.95
Solid feet earthwork..					4,540.20

ABSTRACT.

2,519	Solid feet excavating foundation, at Rs. 0-12-0 per 100 solid feet	19	110
1387	Solid feet filling in do with uncoursed rubble stone and lime, at Rs. 16-0-0 per 100 solid feet	221	14 8
3,375	Solid feet coursed rubble stone and lime masonry, at Rupees 20-0-0 per 100 solid feet.. .. .	675	0 0
96	Solid feet concrete work, at Rs. 10-0-0 per 100 solid feet.. ..	9	9 7
189	Solid feet arching of slabstone and lime, at Rs. 25-0-0 per 100 solid feet.. .. .	47	4 0
319	Solid feet cutstone work dressed, 3rd sort, at Rs. 45-0-0 per 100 solid feet	143	8 9
517	Superficial feet chunam plaster, at Rs. 6-0-0 per 100 solid feet ..	32	13 1
190	Superficial feet large rough stone paving, at Rs. 25-0-0 per 100 solid feet	47	8 0
4,540	Solid feet earthwork, at Rs. 0-12-0 per 100 solid feet.	34	0 9
1	Jungle wood centring, at Rs. 15-0-0 per each	15	0 0
		1245	12 8
Add contingencies at 5 per cent		62	4 7
EXTRA ESTABLISHMENT.			
1	Carcoon for 2 months, at Rs. 10 per month	20	0 0
1	Muccadum do. at Rs. 8 do.	16	0 0
		36	0 0
Total Rs ..		1,344	0 0
Add for one more..		1,344	0 0
* Total Rupees..		2,688	0 0

ESCAPES OF 2 OPENINGS.

GENERAL DESCRIPTION.

The escape to have 2 openings or sluice gates, 2 feet wide and 4 feet deep, each opening being 3 feet apart. The wall of escape to be continued 3 feet beyond sluice, with its crest at the same level as crest of sluice. Beyond that point the wing walls to be carried

with a thickness of one foot, 12 feet into the bank of canal, 3 feet higher than crest of sluice, or 2 feet higher than flood level. The sluice wall to be $2\frac{1}{2}$ feet thick. The foundations of sluice wall to be $3\frac{1}{2}$ feet deep. An apron to be placed on outer side of sluice 4 feet wide and 1 foot deep.

MEASUREMENTS.

	Number.	Length.	Breadth.	Height.	SOLID CONTENTS.
<i>Excavation in Moorum.</i>					
Sluice walls	1	19	3	3.5	199.50
Wing walls.....	2	12	1.75	7	294.00
Apron	1	19	4	2.5	190.00
Total solid feet excavating in moorum..					683.50

	Number.	Length.	Breadth.	Height.	SOLID CONTENTS.
<i>Foundation.</i>					
Sluice walls	1	19	3	3.5	199.50
Wing walls.....	2	6	2.12	2	25.44
Wing walls.....	2	3	1.87	1	11.22
Apron.....	1	19	4	1	76.00
Total solid feet foundation..					312.26

	Number.	Length.	Breadth.	Height.	SOLID CONTENTS.
<i>Superstructure.</i>					
Sluice walls	1	15	2.5	4	150.00
Sluice walls	2	3	2.12	6.5	32.68
Wing walls	2	3	1.87	6.5	72.93
Wing walls	2	6	1	6.5	78.00
Total solid feet superstructure..					383.61

Cutstone Work.

	Number.	Length.	Breadth.	Height.	SUPERFICIAL CONTENTS.
Lengths of sides and sills of sluices	2	10	2.5	....	50
Total superficial feet cutstone work...					50

Woodwork.

	Number.	Length.	Breadth.	Height.	SOLID CONTENTS.
Gates to sluices	2	4.5	2.5	2½	4.68
Total solid feet teak woodwork..					4.68

ABSTRACT.

683	Solid feet excavating, at 1 Rupee per 100 solid feet	6	13	3
312	Solid feet uncoursed rubble masonry, at 16 Rupees per 100 solid feet	49	14	8
384	Solid feet coursed rubble masonry, at 20 Rupees per 100 solid feet	76	12	9
50	Superficial feet 3rd sort cutstone work, at 45 Rupees per 100 superficial feet	22	8	0
5	Solid feet teak wood, at 4 Rupees per cubic foot	20	0	0
Total..		176	0	8
Add Contingencies at 5 per cent		8	12	10
EXTRA ESTABLISHMENT.				
1	Karkoon for ½ month, at 10 Rupees per month	5	0	0
1	Muccadum do. at 8 Rupees do.	4	0	0
Total Rupees for an escape of 2 openings..		194	0	0

(Signed) F. R. GRIFFITH,

Executive Engineer for Irrigation A. N.

ESCAPE OF 2 OPENINGS.

GENERAL DESCRIPTION.

The escape to have two openings or sluice gates, 2 feet wide, and 3 feet deep; each opening being 3 feet apart. The wall of

escape to be continued 3 feet beyond sluice with its crest at the same level as crest of sluice. Beyond that point the wing walls to be carried, with a thickness of one foot, 12 feet in the bank of canal 3 feet higher than crest of sluice, or 2 feet higher than flood level. The sluice wall to be 2 feet thick. The foundations of sluice wall to be $3\frac{1}{2}$ feet deep. An apron to be placed on outer side of sluice 4 feet wide, and 1 foot deep.

• MEASUREMENTS.

<i>Excavation.</i>					
	Number.	Length.	Breadth.	Height.	SOLID CONTENTS.
Sluice walls.....	1	19-0	2-5	3-5	166-25
Wing walls.....	2	12-0	1-5	7-0	252-0
Apron.....	1	19-0	4-0	2-5	190 0
Total solid feet excavation..					608-25

<i>Foundation.</i>					
	Number.	Length.	Breadth.	Height.	SOLID CONTENTS.
Sluice walls.....	1	19-0	2-5	3-5	166-25
Wing walls.....	2	3-0	1-75	2-0	21-00
Wing walls.....	2	3-0	1-25	1-0	7-50
Apron.....	1	19-0	4-0	1-0	76-00
Total solid feet foundation..					270-75

<i>Superstructure.</i>					
	Number.	Length.	Breadth.	Height.	SOLID CONTENTS.
Sluice walls.....	1	15-0	2-0	3-0	90-00
Sluice walls.....	2	3-0	1-75	6-5	68-25
Wing walls.....	2	3-0	1-25	6-5	48-75
Wing walls.....	2	6-0	1-0	6-5	78-00
Total solid feet superstructure...					285-00

Cutstone Work.

	Number.	Length.	Breadth.	Height.	SUPERFICIAL CONTENTS.
Facings of sides and sills of sluices.....	2	8.0	2.0	..	32.00
Total superficial feet 3rd sort cutstone work..					32.00

Woodwork.

	Number.	Length.	Breadth.	Height.	SOLID CONTENT.
Gates to sluices.....	2	3.5	2.5	2.4	3.64
Total solid feet teak wood work...					3.64

ABSTRACT.

608	Solid feet excavation, at 1 Rupee per 100 solid feet.. ..	6	1	3
271	Solid feet uncoursed rubble masonry, at 16 Rupees per 100 solid feet.....	43	5	9
285	Solid feet coursed rubble masonry, at 20 Rupees per 100 solid feet.....	57	0	0
32	Superficial feet 3rd sort cutstone work, at 45 Rupees per 100 superficial feet.. ..	14	6	4
4	Solid feet teak wood, at 4 Rupees per 100 cubic foot.. ..	16	0	0
Total...		136	13	4

Add contingencies at 5 per cent... ..	6	13	5
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ESTABLISHMENT.

1 Karkoon for $\frac{1}{2}$ month, at 10 Rupees per month.. ..	5	0	0
1 Muccadam for $\frac{1}{2}$ month at 8 Rupees per month.. ..	4	0	0
Total Rs.....	153	0	0
Add for two more..	306	0	0
	459	0	0

F. R. GRIFFITH,
Executive Engineer for Irrigation A. N.

ESCAPE OF 3 OPENINGS.

GENERAL DESCRIPTION.

The escape to have three openings or sluice gates, 2 feet wide, and 3 feet deep, each opening to be 3 feet apart. The wall of escape to be continued 3 feet beyond sluices, with its crest at the same level as crest of sluice. Beyond that point the wing wall to be carried out with a thickness of 1 foot, 12 feet into the bank of canal, three feet higher than crest of sluices, or 2 feet above flood level. The sluice wall to be 2 feet thick. The foundation of sluice wall to be $3\frac{1}{2}$ feet deep. An apron to be placed on outer side of sluice 4 feet wide and 1 foot deep.

MEASUREMENTS.

		Number.	Length.	Breadth.	Height.	SOLID CONTENTS.
<i>Excavation.</i>						
Sluice wall	.....	1	24.0	2.5	3.5	210.00
Wing wall	.....	2	12.0	1.5	7.0	252.00
Apron	.....	1	24.0	4.0	2.5	240.00
Total solid feet excavation..						702.00

		Number.	Length.	Breadth.	Height.	SOLID CONTENTS.
<i>Foundation.</i>						
Sluice wall	.....	1	24.0	2.50	3.5	210.00
Wing walls	.....	2	3.0	1.75	2.0	21.00
Wing walls	.....	2	3.0	1.25	1.0	7.50
Apron	.....	1	24.0	4.00	1.0	96.00
Total solid feet foundation..						334.50

Superstructure.

	Number.	Length.	Breadth.	Height.	SOLID CONTENTS.
Sluice walls	1	18.0	2.00	3.0	108.00
Sluice walls	2	3.0	1.75	6.5	68.25
Wing walls	2	3.0	1.25	6.5	48.75
Wing walls	2	6.0	1.00	6.5	78.00
Total solid feet superstructure...					303.00

Cutstone Work.

	Number.	Length.	Breadth.	Height.	SUPERFICIAL CONTENTS.
Facings of sides and sills of sluices	3	8.0	2.0	..	48.00
Total superficial feet 3rd sort cutstone work...					48.00

Woodwork.

	Number.	Length.	Breadth.	Height.	SOLID CONTENTS.
Gate to sluices	3	3.5	2.5	2½	5.46
Total solid feet teak woodwork..					5.46

ABSTRACT.

702	Solid feet excavation, at 1 Rupee per 100 solid feet	7	0	3
334	Solid feet uncoursed rubble masonry, at 16 Rupees per 100 solid feet... ..	53	7	0
303	Solid feet coursed rubble masonry, at 20 Rupees per 100 solid feet	60	9	7
48	Superficial feet, 3rd sort cut stone work, at 45 Rupees per 100 superficial feet	21	9	7
5	Solid feet teak wood, at 4 Rupees per cubic foot	20	0	0
Total...		162	10	5
Add contingencies at 5 per cent.		8	2	1
ESTABLISHMENT.				
1	Karkoon for $\frac{1}{2}$ month, at 10 Rupees per month	5	0	0
1	Muccadam for $\frac{1}{4}$ month, at 8 Rupees per month	4	0	0
Total Rs...		180	0	0

F. R. GRIFFITH,

Executive Engineer for Irrigation A. N.

COMMUNICATION BRIDGE OF 32 FEET SPAN.

GENERAL DESCRIPTION.

The bridge to consist of one segmental arch of 32 feet span, $6\frac{1}{2}$ feet rise, and 2 feet thick. Abutments to be 6 feet thick. Foundation of abutments to be carried down $1\frac{1}{2}$ feet lower than the bed of canal, with 3" offsets. Spandril wall to be nine feet high. Roadway to be covered with 9" of moorum. The parapet walls to be protected from injury by traffic by guardstone.

MEASUREMENTS.

	Number.	Length.	Breadth.	Depth.	SOLID FEET.
<i>Excavating Foundation.</i>					
Abutments.....	2	21.5	6.5	5.5	1537.25
Wing walls	4	13.5	mean 2.75	2.5	371.25
Solid feet excavating foundation.....					1908.5

<i>Filling in Foundation with uncoursed Rubble Stone and Lime.</i>	Number.	Length.	Breadth.	Depth.	SOLID FEET.
Abutments.....	2	21.5	6.5	1.5	419.25
Wing walls.....	4	13.5	2.75	2.5	371.25
Solid feet filling in foundation with uncoursed rubble stone and lime..					790.5

<i>Superstructure, Coursed Rubble Stone and Lime.</i>	Number.	Length.	Breadth.	Height.	SOLID FEET.	SOLID FEET.
Abutments.....	2	21	6	4	1,008.00	
Wing walls	4	121.49	..	..	485.96	
Spandrils.....	2	44.00	2	9	1,584.00	
Parapet walls.. ..	2	36.5	1.5	2.5	273.75	
End pillars of walls.....	4	1.75	1.75	2.5	30.62	
Backing.....	2	17	area. 25.5		867.00	4,240.33
Deduct archway with arching..	2	area. 220.69	2		882.76	882.76
Solid feet coursed rubble stone and lime masonry ..						3,366.57

<i>Slabstone and Lime Arching faced with block stone.</i>	Number.	Length.	Breadth.	Depth.	SOLID FEET.
Arching.....	1	21	area. 77.74		1,632.54
Solid feet slabstone arching faced with block stone voussoirs...					1,632.54

Coping of Cutstone, dressed, 3rd sort.

	Number.	Length.	Breadth.	Depth.	SOLID FEET.
Coping centre portion of parapet	2	35.5	2.5	5	88.75
Do. of end pillars	4	2.75	2.75	.5	15.12
String course cornice	2	45	.5	.5	22.5

Solid feet cutstone work, dressed, 3rd sort... 126.37

Filling in with earth.

	Number.	Length.	Breadth.	Depth.	SOLID FEET.
Over archway and abutments.....	1	17	area 124.31		2,113.27
Between wing walls.....	2	9	area 233.68		4,206.24
Approaches.....	2	171	area 139.18		47,599.56

Solid feet earthwork..... 53919.07

Filling in and spreading Moorum.

	Number.	Length.	Breadth.	Depth.	SOLID FEET.
Over bridge.....	1	44	18	7.5	594
Ditto approaches.....	2	180	20	7.5	5,400

Solid feet filling in and spreading moorum... 5,994

Guardstone.

	Number.	Length.	Breadth.	Depth.	NUMBER.
Guardstones.....	10	2	1	1	10

No. of Guardstones... 10

ABSTRACT.

1,908	Solid feet excavating foundation, at Rs. 0-12-0 per 100 solid feet.	14	4	11
790	Solid feet filling in ditto with uncoursed rubble stone and lime, at Rs. 16-0-0 per 100 solid feet.. .. .	126	6	4
3,367	Solid feet coursed rubble stone and lime masonry, at Rs. 20-0-0 per 100 solid feet	673	6	4
1,633	Solid feet slabstone arching faced with blockstone voussoirs, at Rs. 40-0-0 per 100 solid feet... .. .	653	3	2
126	Solid feet coping of cutstone, dressed, 3rd sort, at Rs. 45-0-0 per 100 solid feet.. .. .	56	11	2
53,919	Solid feet filling in with earth for approaches at Rs. 0-12-0 per 100 solid feet.. .. .	404	6	3
5,994	Solid feet filling and spreading moorum, with rolling, at Rs. 1-0-0 per 100 solid feet	59	15	0
10	No. of guardstone at Rs. 1-8-0 each.. .. .	15	0	0
1	Junglewood centering at Rs. 100 per each.. .. .	100	0	0
Contingencies at 5 per cent		2,103	5	2
		105	2	8
EXTRA ESTABLISHMENT.				
1	Karkoon for 6 months, at 10 Rupees per month.. 60 0 0			
1	Muccadum do. at 8 Rupees do. .. 48 0 0	108	0	0
Total Rs..		2,316	0	0
Add for two more... .. .		4,632	0	0
Total for 3 bridges..		6,948	0	0

COMMUNICATION BRIDGE OF 25 FEET SPAN.

GENERAL DESCRIPTION.

The bridge to consist of one segmental arch of 25 feet span, 5 feet rise, and 1.75 feet thick. Abutments to be 5 feet thick. Foundation of abutments to be carried down $1\frac{1}{2}$ foot lower than the bed of the canal with 3" offsets. Spandril wall to be 7.25 feet high. Roadway to be covered with 9" of moorum. The parapet walls to be protected from injury by traffic by guardstones.

**BRIDGE OF ONE ARCH 25 FEET SPAN.
MEASUREMENTS.**

Excavating Foundation.

	Number.	Length.	Breadth.	Depth.	SOLID FEET.
Abutments.....	2	21.5	5.5 mean	5	1,182.5
Wing walls	4	10.87	2.62	2	227.83
Counterforts of abutments	4	2.5	.5	5	25
Solid feet excavating foundation.....					1,435.33

*Filling in Foundation with uncoursed rubble
stone and lime.*

	Number.	Length.	Breadth.	Depth.	SOLID FEET.
Abutments.....	2	21.5	5.5 mean	1.5	354.75
Wing walls	4	10.87	2.62	2	227.83
Counterforts of abutments.....	4	2.5	.5	1.5	7.5
Solid feet filling in foundation with uncoursed stone and lime...					590.08

	Number.	Length.	Breadth.	Height.	SOLID FEET.	SOLID FEET.
<i>Superstructure—coursed rubblestone and lime masonry.</i>						
Abutments.....	2	21	.5	3.5	735	
Counterforts.....	4	2	.5	3.5	14	
Wing walls.....	4	75.51 s. feet.	...	..	302.04	
Spandrils.....	2	36	2	7.25	1,044	
Parapet walls.....	2	32.5	1.5	2.5	243.75	
End pillars of walls....	4	1.75	1.75	2.5	30.62	
Backing.....	2	17	area. 16.25		552.5	2,921.91
Deduct archway with arching..	2	area. 139.47		2	557.88	557.88
Solid feet coursed rubble stone and lime masonry ..						2,364.03

	Number.	Length.	Breadth.	th. Dep	SOLID FEET.
<i>Slabstone Arching faced with blockstone voussoirs.</i>					
Archring.....	1	21	ca. 53'64		1,126'44
Solid feet slabstone arching faced with blockstone voussoirs..					1,126'44

	Number.	Length.	Breadth.	Depth.	SOLID FEET.
<i>Coping of Cutstone, dressed, 3rd sort.</i>					
Coping centre portion of parapet.....	12	31'5	2'5	'5	78'75
Do. of end pillars.....	4	2'75	2'75	'5	15'12
String course cornice.....	12	37	'5	'5	18'5
Solid feet cutstone work, dressed, 3rd sort..					112'37

	Number.	Length.	Breadth.	Depth.	SOLID FEET.
<i>Filling in with earth.</i>					
Over archway and abutment.....	1	17	area. 81'78		1,390'26
Between wing walls.....	2	7'75	area. 179'88		2,788'14
Approaches.....	2	137'25	area. 103'75		28,479'37
Solid feet earthwork...					32,657'77

	Number.	Length.	Breadth.	Depth.	SOLID FEET.
<i>Filling in and spreading Moorum.</i>					
Over bridge.....	1	36	18	'75	486
Do. approaches.....	2	145	20	'75	4,350
Solid feet filling in and spreading moorum..					4,836

<i>Guardstones.</i>					
	Number.	Length.	Breadth.	Depth.	NUMBER.
Guardstones	8	2	1	1	8
Nos. Guardstones..					8

ABSTRACT.

1,435	Solid feet excavating foundation, at Rs. 0-12-0 per 100 solid feet..	10	12	2
590	Solid feet filling in foundation, with uncoursed rubble stone and lime masonry, at Rs. 16-0-0 per 100 solid feet.. .. .	94	6	4
2,364	Solid feet coursed rubble stone and lime masonry, at Rs. 20-0-0 per 100 solid feet... .. .	472	12	9
1,126	Solid feet slabstone arching, faced with blockstone voussoirs, at Rs. 40-0-0 per 100 solid feet.. .. .	450	6	4
112	Solid feet coping of cutstone dressed, 3rd sort, at Rs. 45-0-0 per 100 solid feet.. .. .	50	6	4
32,658	Solid feet filling in with earth for approaches, at Rs. 0-12-0 per 100 solid feet.. .. .	241	14	11
1,836	Solid feet spreading moorum with rolling, at R. 1-0-0 per 100 solid feet.. .. .	48	5	9
8	Number of Guardstones, at Rs. 1-8-0 each	12	0	0
1	Junglewood centering, at Rs. 60-0-0 each.. .. .	60	0	0
Total...		1,441	0	7

Add contingencies at 5 per cent... .. . 72 3 2

EXTRA ESTABLISHMENT.

1	Carcoon for 4 months, at 10 Rupees per month.. .. .	40	0	0
1	Muccadam for 4 months, at 8 Rupees per month.. .. .	32	0	0
		72	0	0
Total Rs.....		1,588	3	9
Add for four more.. .. .		6,352	15	0
Total for five bridges..		7,941	0	0

COMMUNICATION BRIDGE OF ONE ARCH 22 FEET SPAN.

GENERAL DESCRIPTION.

The bridge to consist of one segmental arch of 22 feet span, $4\frac{1}{2}$ feet rise, and $1\frac{1}{2}$ foot thick. Abutments to be $4\frac{1}{2}$ feet thick. Foundation of abutments to be carried down $1\frac{1}{2}$ foot lower than the bed of the canal, with 3" offsets. Spandril wall to be 6.50 feet high. Roadway to be covered with 9" of moorum. The parapet wall to be protected from injury by traffic by guardstones.

MEASUREMENTS.

<i>Excavating Foundation.</i>					SOLID FEET.
Number.	Length.	Breadth.	Depth.		
Abutments.....	2	21.5	5 mean	4.5	967.5
Wing walls.....	4	9.75	2.62	2	204.36
Solid feet excavating foundation..					1,171.86

<i>Filling in Foundation with uncoursed rubble stone and lime.</i>					SOLID FEET.
Number.	Length.	Breadth.	Depth.		
Abutments.....	2	21.5	5 mean	1.5	322.5
Wing walls.....	4	9.75	2.62	2	204.36
Solid feet filling in foundation..					526.86

	Number.	Length.	Breadth.	Height.	SOLID FEET.	SOLID FEET.
<i>Superstructure: coursed rubble stone and lime masonry.</i>						
Abutments	2	21 s. feet.	4.5	3	567	
Wingwalls	4	73.93	..	..	295.72	
Spandrels	2	31	1.75	6.5	705.25	
Parapet walls	2	27.5	1.5	2.5	206.25	
End pillars of do.	4	1.75	1.75	2.5	30.62	
Backing	2	17.5	area. 13.75		481.25	2,286.09
Deduct archway with archring...	2	area. 108.53		1.75	379.85	379.85
Solid feet coursed rubble stone and lime masonry.....						1,906.24

	Number.	Length	Breadth.	Depth.	SOLID FEET.
<i>Slabstone and lime Arching faced with blockstone.</i>					
Archring	1	21	area. 40.46		849.66
Solid feet slabstone arching faced with blockstone voussoirs..					849.66

	Number.	Length.	Breadth.	Depth.	SOLID FEET.
<i>Coping of cutstone, dressed, 3rd sort.</i>					
Coping, centre portion of parapet	2	26.5	2.5	.5	66.25
Do. of end pillar	4	2.75	2.75	.5	15.12
String course cornice	2	3.2	.5	.5	16
Solid feet cutstone work, dressed, 3rd sort..					97.37

Filling in with earth.

	Number.	Length.	Breadth.	Depth.	SOLID FEET.
Over archway and abutments	1	17.5	area. 65.47		1,145.72
Between wing walls	2	6.5	area. 158.13		2,055.69
Approaches	2	123.5	area. 100.05		24,712.35
Solid feet earthwork..					27,913.76

Filling in and spreading Moorum.

	Number.	Length.	Breadth.	Depth.	SOLID FEET.
Over bridge.....	1	31	18	.5	279
Over approaches	2	130	20	.5	2,600
Solid feet filling in and spreading Moorum..					2,879

Guardstones.

	Number.	Length.	Breadth.	Depth.	NUMBER.
Guardstones	8	2	1	1	8
Number of Guardstones...					8

ABSTRACT.

1,172	Solid feet excavating foundation, at Rs. 0-12-0 per 100...	8	12	7
527	Solid feet filling in foundation with uncoursed rubble stone and lime, at Rs. 16-0-0 per 100 solid feet	84	5	1
1,906	Solid feet coursed rubble stone and lime masonry, at Rs. 20 per 100 solid feet... ..	381	3	2
850	Solid feet slabstone arching faced with block stone voussoirs, at Rs. 40 per 100 solid feet	340	0	0
97	Solid feet coping of cutstone, dressed, 3rd sort, at Rs. 45-0-0 per 100 solid feet	43	10	4
27,914	Solid feet filling in with earth for approaches, at Rs. 0-12-0 per 100 solid feet	209	5	8
2,879	Solid feet spreading moorum, with rolling, at Rs. 1-0-0 per 100 solid feet... ..	28	12	7
8	No. of Guardstones, at Rs. 1-8-0 each	12	0	0
1	Junglewood centering, at Rs. 45-0-0 each	45	0	0
Total...		1,153	1	5
Contingencies at 5 per cent.		57	10	5
EXTRA ESTABLISHMENT.				
1	Carcoon for 3 months, at Rs. 10 per month	30	0	0
1	Muccadum for 3 months, at Rs. 8 per month	24	0	0
		54	0	0
Total Rs...		1,265	0	0
Add for one more		1,265	0	0
Total for 2 Bridges...		2,530	0	0

BUNGALOW AND OUTHUSES FOR SUPERINTENDENT OF THE LAKH IRRIGATION PROJECT.

GENERAL DESCRIPTION.

The Bungalow for the use of the Executive Officers in charge of the Lakh project during its construction, and after that for the accommodation of the Overseer or Superintendent of the Irrigation works, is to be built of stone and lime rubble masonry, with teak-wood roof covered with double tiles; all walls to be plastered with

single coat, and whitewashed inside and painted outside. Floors to be of well rammed moorum, with the exception of bathroom, which is to be paved with second sort cutstone. All woodwork to be of teak. Doors of two main rooms to be fitted with glass windows, also to be glazed. Everything else as per estimate.

Amount, Rupees.2,037 0 0

Outhouses to resemble main building, with the exception of plastering and whitewashing and ceiling. They are to be covered with single tiles as per estimate.

Amount, Rupees..... 600 0 0

Total Rupees.... 2,637 0 0

MEASUREMENTS.

	Number.	Length.	Breadth.	Height.	SOLID CONTENT.
<i>Excavation for Foundation.</i>					
Long walls.....	2	37.50	2.50	2	375.00
Short walls.....	8	11.00	2.50	2	165.00
Verandah long wall.....	1	13.50	2.25	2	60.75
Do. short wall.....	1	9.50	2.25	2	42.75
Do. cross walls.....	4	5.00	2.25	2	90.00
Verandah.....	1	14.50	2.00	2	58.00
Do. long side.....	1	37.5	2.00	2	150.00
Do. short side.....	1	4.0	2.00	2	16.00
Steps.....	2	6.0	1.50	1	18.00
Total solid feet excavation.....					<u>975.50</u>

	Number.	Length.	Breadth.	Height.	SOLID CONTENT.
<i>Filling in Foundation.</i>					
Same as excavation.....	975.50
Total solid feet filling in foundation.....					<u>975.50</u>

<i>Plinth.</i>	Number.	Length.	Breadth.	Height.	SOLID CONTENT.
Long walls	2	37·0	2·0	1·50	222·00
Short walls	3	11·5	2·0	1·50	103·50
Verandah long walls	1	13·0	1·75	1·50	34·12
Do. short wall.....	1	9·0	1·75	1·50	23·62
Do. cross walls.....	4	5·5	1·75	1·50	57·75
Verandah.....	1	15·0	1·50	1·50	33·75
Do. long side.....	1	37·0	1·50	1·50	83·25
Do. short sides.....	2	4·5	1·50	1·50	20·25
Total solid feet Plinth. . .					578·24

<i>Superstructure.</i>	Number.	Length.	Breadth.	Height.	SOLID CONTENT.
Long walls.....	2	36·5	1·5	11·0	1,104·50
Short walls.....	3	12·0	1·5	11·0	594·00
Verandah long wall.....	1	12·5	1·25	7·0	109·37
Do. short wall.....	1	8·5	1·25	7·0	74·37
Do. cross wall.....	4	6·0	1·25	8·75	262·50
Total...					2,144·74
<i>Deduct.</i>					
Doors.....	3	4	1·5	7·0	126·00
Doors.....	1	2·5	1·50	6·0	22·50
Doors.....	1	2·5	1·25	6·0	18·75
Doors.....	1	3·0	1·25	6·0	22·50
Windows	4	3·0	1·25	4·0	72·00
Windows.....	1	2·0	1·25	2·0	15·00
Total solid feet superstructure.....					1,867·99

	Number.	Length.	Breadth.	Height.	SQUARE FEET.
<i>Plastering inside.</i>					
Long walls of large room	2	20	.....	10·5	420·00
Short walls of large room	2	15	.....	10·5	315·00
Long wall of large room in verandah ...	1	10	.....	10·5	105·00
Long wall of large room in verandah ...	1	10	.....	7·25	72·50
Short walls of large room in verandah...	2	6	.....	8·75	105·00
Long wall of small room in verandah ...	1	6	.....	10·5	63·00
Long wall of small room in verandah ...	1	6	.....	7·25	43·50
Short walls of small room in verandah...	2	6	.....	8·75	105·00
Long walls of small room	2	12	.....	10·5	252·00
Short walls of small room	2	10	.....	10·5	210·00
				Total...	1691·00
<i>Deduct.</i>					
Doors	4	4·0	.....	7	112
Doors	2	2·5	.....	6	30
Doors	1	3·0	.....	6	18
Windows	4	3·0	.....	4	48
Windows	3	2·0	.....	2	12
				Total...	220
Total square feet plastering.....					1,471

	Number.	Length.	Breadth.	Height.	SUPERFICIAL CONTENT.
<i>Whitewash.</i>					
Same as plastering	1,471
Total superficial feet whitewash...					1,471

Woodwork.

	Number.	Length.	Breadth.	Height.	SOLID CONTENT.
Wall plates, long walls...	2	36.5	.33	.41	9.87
Wall plates, short walls...	2	18.0	.33	.41	4.87
Wall plates, long wall in verandah	1	12.5	.33	.33	1.36
Wall plates, short wall in verandah	1	8.5	.33	.33	.92
Wall plates, cross walls in verandah	4	8.5	.33	.33	3.79
Posts in verandah	6	.33	.33	7.5	4.90
Post plate	1	37.0	.33	.33	4.02
Post plate	1	16.5	.33	.33	1.79
Pole plates long walls	2	36.5	.33	.41	9.87
Pole plates short walls	2	18.0	.33	.41	4.87
Total solid feet woodwork ...					46.26

Roofing.

	Number.	Length.	Breadth.	Height.	SUPERFICIAL CONTENT.
Main Bungalow...	1	2	39 × 15	.57	666.90
Verandah	1	39	8.75	...	341.25
Verandah	1	39	10.25	...	399.75
Total superficial feet roofing...					1407.90

Flooring.

	Number.	Length.	Breadth.	Height.	SOLID CONTENT.
Large room	1	19.5	14.5	1.5	424.12
Small room	1	11.5	14.5	1.5	250.12
Verandah large room	1	9.5	5.5	1.5	78.37
Verandah small room	1	5.5	5.5	1.5	45.37
Verandah	1	15.0	4.75	1.5	106.85
Verandah	1	33.5	4.75	1.5	226.12
Total solid feet of flooring.....					1,130.95

Ceiling.

	Number.	Length.	Breadth.	Height.	SUPERFI- CIAL. CONTENT.
Large room	1	20	15	....	300
Small room	1	12	15	....	180
Room in Verandah	1	6	6	....	36
Total superficial feet ceiling.....					516

Cutstone Work.

	Number.	Length.	Breadth.	Height.	SOLID CONTENT.
Steps, 1st Course	2	6	1.5	1	18
Steps, 2nd Course.....	2	6	1.0	.75	9
Total solid feet for cutstone work					27

Pavement.

	Number.	Length.	Breadth.	Height.	SUPERFI- CIAL. CONTENT.
Paving the small room in verandah.....	1	6	6	....	36
Total superficial feet pavement.....					36

Doors and Windows.

	Number.	Length	Breadth.
Doors	3	4	7
Doors.....	2	2.5	6
Doors.....	1	3	6
Windows	4	3	4
Windows	3	2	2

ABSTRACT.

975.50	Solid feet excavation, at 12 annas per 100 solid feet	7	5	0
975.50	Solid feet filling in foundation, at 16 rupees per 100 solid feet ..	156	1	3
578.24	Solid feet plinth, at 16 rupees per 100 solid feet.. ..	92	8	4
1,867.99	Solid feet of superstructure uncoursed rubble masonry and chunam, at 18 rupees per 100 solid feet	336	3	10
1,471.00	Superficial feet plastering, at 6 rupees per 100 superficial feet..	88	4	2
1,471.00	Superficial feet whitewash, at 5 annas per 100 superficial feet ..	4	9	7
46.26	Solid feet woodwork, at 4 rupees per cubic foot.. ..	185	0	8
1,407.90	Superficial feet roofing, at 45 rupees per 100 superficial feet ..	633	8	11
1,130.95	Solid feet flooring, at 1½ rupee per 100 solid feet.. ..	16	15	5
516.00	Superficial feet ceiling, at 15 rupees per 100 superficial feet ..	77	6	5
27.00	Solid feet cut-stone work, at 30 rupees per 100 solid feet.. ..	8	1	7
36.00	Superficial feet pavement, at 35 rupees per 100 superficial feet..	12	9	7
3	Doors at 42 rupees.	126	0	0
2	Doors at 18¾ rupees... ..	37	8	0
1	Door at 22½ rupees.. ..	22	8	0
4	Windows at 18 rupees	72	0	0
3	Windows at 4 rupees	12	0	0
Total. . . .		1,888	10	9
Add contingencies at 5 per cent.		94	6	6

ESTABLISHMENT.

1	Karkoon for 3 months, at 10 rupees per month	30	0	0
1	Muccalum for 3 months, at 8 rupees per month	24	0	0
Total. . . .		2,037	0	0

OUTHOUSES.

MEASUREMENTS.

					Number.	Length.	Breadth.	Height.	SOLID FEET.
<i>Excavation for Foundation.</i>									
Long walls	..	..	..	..	2	21	2.25	2	189.00
Short wall	..	..	..	..	1	15	2.25	2	67.50
Do.	..	..	..	..	1	15	2.50	2	75.00
Intermediate wall	..	..	..	..	1	7	2.25	2	31.50
Verandah	..	..	..	..	1	15	2.00	2	60.00
Total solid feet excavation....									423.00

					Number.	Length.	Breadth.	Height.	SOLID FEET.
<i>Filling in Foundation.</i>									
Same as Excavation	423.00
Total solid feet filling in foundation....									423.00

					Number.	Length.	Breadth.	Height.	SOLID FEET.
<i>Plinth.</i>									
Long walls	..	..	..	..	2	20.50	1.75	1	71.75
Short wall	...	..	..	..	1	15.50	1.75	1	27.12
Short wall	..	..	..	..	1	15.50	2.00	1	31.00
Intermediate wall	..	..	..	..	1	7.50	1.75	1	13.12
Verandah	..	..	..	..	1	15.50	1.50	1	23.25
Total solid feet plinth....									166.24

Superstructure.

	Number.	Length.	Breadth.	Height.	SOLID FEET.
Long walls	2	20	1.25	8.0	400.00
Triangular portion over long walls ..	2	10	1.25	5.6	140.00
Short wall	1	16	1.25	8.0	160.00
Short wall	1	16	1.50	13.6	326.40
Intermediate wall	1	8	1.25	8.0	80.00
Triangular portion over intermediate wall.	1	4	1.25	5.6	28.00
Seats	1	5	1.5	1.5	11.25
Ovens	1	8	3.0	2.5	60.00
				Total...	1,205.65
Door	1	3.0	1.25	6	22.50
Door	1	2.5	1.25	6	18.75
Windows	2	2.0	1.25	2	10.00
				Total...	51.25
Total solid feet superstructure....					1,154.40

Woodwork.

	Number.	Length.	Breadth.	Height.	SOLID FEET.
Plank over the seats	1	6.0	1.5	.12	.96
Wall plates long walls	2	22.0	.25	.33	3.66
Do. short walls	2	18.5	.25	.33	3.05
Do. intermediate wall	1	10.5	.25	.33	.86
Posts in the verandah	1	.33	.33	8.00	.87
Postplates	1	18.5	.33	.41	2.40
Total solid feet woodwork....					11.80

Roofing.

	Number.	Length.	Breadth.	Height.	SUPERFICIAL FEET.
Roof over the building	1	2 x	21 x 20	x .57	478.80
Roof over the chimney	1	5	8	..	40.00
Total superficial feet roofing....					518.80

<i>Doors and Windows.</i>						Number.	Length.	Breadth.	Height.	TOTAL.
Door	..	..	..	..	..	1	3	..	6	..
Door	..	..	..	..	..	1	2.5	..	6	..
Windows	..	..	..	..	..	2	2	..	2	..

ABSTRACT.

423	Solid feet excavation, at 12 annas per 100 solid feet ..	..	..	..	3	2	9
423	Solid feet filling in foundation, at 16 Rs. per 100 solid feet ..	..	..	..	67	10	11
166.24	Solid feet plinth, at 16 Rs. per 100 solid feet..	..	..	..	26	9	7
1,154.40	Solid feet superstructure uncoursed rubble masonry, at 18 Rs. per 100 solid feet ..	..	..	..	207	12	8
508.80	Roofing, at 30 Rs. per 100 superficial feet ..	..	..	..	152	10	3
11.80	Solid feet woodwork, at 4 Rs. per cubic feet..	..	..	..	47	3	2
1	Doors at 22½ Rupees each ..	..	..	..	22	8	0
1	Door at 18¾ Rupees each ..	..	..	..	18	12	0
2	Windows at 4 Rupees each ..	..	..	..	8	0	0
Total....					554	5	4
Add Contingencies at 5 per cent ..					27	11	6
ESTABLISHMENT.							
1	Karkoon for one month, at 10 Rs. per month ..	..	..	..	10	0	0
1	Muccadum for one month, at 8 Rs. per month ..	..	..	..	8	0	0
Total amount....					600	0	0

Bungalow..... 2,037

Outhouses 600

Total...: 2,637

(Signed) J. G. T. GRIFFITH,
Executive Engineer for Irrigation A. & N.

RECAPITULATION.

1 Dam and head works.	58,783	0	0
2 Canals.	1,00,167	0	0
2 Aqueducts of one arch, 10 ft. span, and 17½ ft. breadth at bottom, in the 3rd mile	2,942	0	0
1 Aqueduct of 6 arches, 10 ft. span, 16½ ft. breadth at bottom, in the 5th mile.	3,707	0	0
3 Aqueducts of one arch, 10 ft. span, 16½ ft. breadth at bottom, between the 4th and 6th miles	4,455	0	0
4 Aqueducts of one arch, 10 ft. span, 15 ft. breadth at bottom, between the 6th and 9th miles	5,896	0	0
1 Aqueduct of 2 arches, 10 ft. span, 15 ft. breadth at bottom, in the 8th mile	1,703	0	0
2 Aqueducts of one arch, 10 ft. span, 13½ ft. breadth at bottom, between the 9th and 13th miles	1,456	0	0
1 Aqueduct of 4 arches, 10 ft. span, 13½ ft. breadth at bottom, in the 12th mile	2,551	0	0
2 Aqueducts of one arch, 10 ft. span, 12½ ft. breadth at bottom, between the 14th and 15th miles	2,688	0	0
ESCAPES.			
1 Escape of 2 feet openings, 2 by 4	194	0	0
3 Do. do. 2 by 3	306	0	0
1 Do. 3 do. 2 by 3	180	0	0
COMMUNICATION BRIDGES.			
3 Bridges of 32 feet span	6,948	0	0
5 Do. 25 do.	7,941	0	0
2 Do. 22 do.	2,530	0	0
A Bungalow with outhouses	2,637	0	0
25 Regulators for branch canals, at 250 Rs. each			
	2,05,048	0	0
	6,250	0	0
Total Rs.	2,11,829	0	0

(Signed) J. G. T. GRIFFITH,

Executive Engineer for Irrigation A. & N.

(Signed) J. G. FIFE, Lieutenant-Colonel,

Superintending Engineer for Irrigation

II.—C. W. Irrigation.
Lakh Project.

540 C. W.
No. 1212 OF 1866.

Public Works Department.

Bombay Castle,
18th June 1866.

Letter from the Acting Revenue Commissioner Southern Division,
No. 2077, dated 19th June 1865.

Submits a letter from the Superintending Engineer for Irrigation, with plans and estimates for a project for irrigating land in the Paihra and Godavery Valleys, near Newassa, in the Ahmednuggur Collectorate.

RESOLUTION.—The project should be submitted to the Government of India for inclusion in the list of those for which it is recommended a loan should be raised.

2. It appears that the estimate of revenue is derived from areas of land capable of being watered by one cubic foot of supply per second.

Mr. Griffith gives:—

Major Francis:—

	Rate.	Rate.
Sugarcane, 100 acres	4 Rs.	6 Rs.
Rubbee 150 „	3 „	4 „
Monsoon 100 „	2 „	2 „

3. Captain Baird Smith, R. E., (Bengal) in his Italian Irrigation gives, at the following rates:—

Summer Meadow	90 acres.	} Per cubic foot per second.
Winter „	3 „	
Rice	40 „	
Indian Corns, &c.	180 „	

and classes sugarcane with rice.

4. Mr. Griffith's estimate of Rubbee irrigation might be classed with Captain Baird Smith's Indian Corns, &c., but inasmuch as the evaporation may be considered greater in India than Italy, the quantity of land will be less, and may be left at 150 acres.

5. The monsoon crops (Khurreef), composed of rice and indigo, being chiefly reared by the water of the direct rainfall, may

not require more assistance from irrigation than Mr. Griffith has estimated.

This would give:—

* Major Francis' rates.	600 acres	(@) *6 Rs.	3,600
	5,400	„ (t) 4 „	21,600
	10,100	„ (t) 2 „	20,200
			<hr/>
			45,400
		Deduct maintainance. . . .	10,564

34,836

which would give $16\frac{1}{2}$ per cent. interest, and this is probably the minimum.

Major Francis' estimate is	.....	20 per cent.
Colonel Fife's on Mr. Griffith's low rates	15	„
Mr. Griffith's own	.....	16 „

T. F. DOWDEN, Lieut., R. E.,
Under Secretary to Government.

**SELECTIONS FROM THE RECORDS OF THE BOMBAY
GOVERNMENT.**

No. IV.—NEW SERIES.

**REPORT ON THE COLLECTORATE OF
SHOLAPORE;**

BY

MESSRS. J. D. INVERARITY & J. S. INVERARITY.

STATISTICAL REPORT OF CAMBAY;

BY

MR. A. SUMMERS.

Bombay :

PRINTED FOR GOVERNMENT

AT THE

BOMBAY EDUCATION SOCIETY'S PRESS.

1854.

REPORT ON THE COLLECTORATE OF
SHOLAPORE;

BY

MESSRS. J. D. INVERARITY & J. S. INVERARITY.

REPORTS ON THE SHOLAPORE COLLECTORATE.

No. 677 OF 1850.

From J. D. INVERARITY, Esq.,

Collector of Sholapore,

To E. H. TOWNSEND, Esq.,

Revenue Commissioner, Southern Division.

SIR,

I have the honour to submit, as required in Mr. Chief Secretary Reid's letter to your address No. 4223, of the 30th December 1843, a Report on the general state and condition of the Sholapore Collectorate, which consists of a strip of country of 170 miles in length, and of a breadth varying from 8 to 60 miles, situated between $16\frac{1}{4}^{\circ}$ and $18\frac{1}{2}^{\circ}$ N. latitude, and $75\frac{3}{8}^{\circ}$ and $76\frac{1}{2}^{\circ}$ E. longitude, and much intersected on its eastern border by possessions of the Akulkote Rajah, and of His Highness the Nizam.

The Collectorate contains 910 Government and 117 alienated villages, divided into 9 talookas, and possessing approximately on the 1st January last (1850) a population of 574,491 Hindoos, and 55,992 Mussulmans, being respectively an increase of nearly $4\frac{1}{2}$ per cent. on the Hindoo and Mussulman population of the 1st January 1846.

The general face of the country may be described as undulating,—alternate upland and hollow,—with occasionally a valley of moderate extent, and devoid of trees, except around villages, and in the Barsee talooka, where there are large mango topes, and in Mungolee and Moodebehal, where date-trees abound: a few barren hills in the neighbourhood of Hortee, to the north of Beejapore, and a small belt of hills in Moodebehal, a few miles north of the Krishna river, constitute the only eminences in the country. The uplands, with little depth of soil, afford convenient pasturage, while the deeper soils of the low lands are capable, under careful cultivation, of yielding the richest returns.

The climate is dry and healthy, and, with reference to the periodical rains, improves as we approach the Krishna river, which forms the southern limit of the Collectorate. The rivers Bheema and Seena, bounding on the west and east the talookas of Kurmulla, Mareh, and Mohol, become confluent nearly at

the centre of the Collectorate, and the Bheema, taking an easterly course, form the line of demarcation between the Mahratta and Canarese races, who are as diverse in character as in language, the prudence and economy of the latter contrasting favourably with the improvidence and unthrifty habits of the superstitious and priest-ridden Mahratta.

Numerous tributary streams throughout the country supply an abundance of water for general purposes, and in many instances are made subservient to the irrigation of land. Of these the chief are the Bhogawutec in Barsee, and the Dhone, which flows eastward through the heart of the southern districts, the fertility of whose banks has passed into a proverb. Other streams there are that are not perennial, but even in these, when superficially dry, water can be had by digging.

The average fall of the monsoon rains at Sholapore measures 22 inches, and the relative proportion of early and late crops is one-third of the former to two-thirds of the latter. Early crops are sown in light and inferior soils, which require repeated falls of rain; the deep black soil, which, when thoroughly wetted, retains an abundance of moisture, is set apart for the more valuable crops of joaree, wheat, grain, kurdee, cotton, &c. which ripen in the cold season.

The population of these districts is for the most part agricultural: the ryots are decently dressed, and by no means meagre in appearance. Their condition has been undoubtedly much improved by the operations of the survey, and an independence of character is here and there observable, as a natural result; but I fear their agricultural stock is inadequate to the due cultivation of the land now under the plough. Substantial farmers are to be met with in every village of any size; and, on the other hand, there are various degrees of poverty to be found; but where wants are so few, absolute distress is likely to be unknown, except on the occurrence of a season of general failure or famine, when, where nature has already been reduced to the lowest scale of existence, retrenchment of its necessities must entail a diminution of life.

Where cotton is grown, this crop alone provides the means of paying the land rent; and the ryots' resources are increased by the sale of the cotton thread which is spun by the females of his family. Every district has several towns, where markets are held once or twice a week, and where are regulated the prices of grain, whose relative bulk and value do not admit of distant transport from the place of production.

Many flourishing traders—oilmen, weavers, and dyers—are scattered over the Collectorate. The towns of Barsee, Sholapore, and Wyrag, exhibit, in their substantial appearance, and in the opulence of their inhabitants, the good effects of the transit and home trade they enjoy. Through the first town, it is estimated that 14,500 candies of cotton from the Nizam's districts beyond the Bala ghaut pass annually to Bombay, and that half this quantity from the Nizam's districts around Koolburga, and from the four Canarese talookas of

this Collectorate, pass through Sholapore, where, as in Barsee, Bhattea agents from Bombay are employed during the season to purchase the staple for merchants at the Presidency. The trade of Wyrag consists in sooparee or betelnuts, and groceries from North Canara, and Hooblee in the Southern Mahratta Country, which are distributed by its merchants over the Nizam's Country. Kurmulla and Hypurga are the large grain marts of the zillah: the former provides Poona with bajree, receiving in return rice; the latter furnishes the surrounding country with joaree, and, together with Indee, exports to Poona a large quantity of kurdee and linseed oil, receiving groceries in return. There are also minor bazars along the eastern frontier of the southern talookas, whence supplies of cloth and grain are furnished to the territories of the Nizam, and his feudatory the Rajah of Shorapore. Cotton and woollen cloths made in Sholapore and Mungolce are retailed through the country, and the crimson and black dyed yarns of Wulsung and Churchun are in much request.

The state of education among the people is most backward. For a population of upwards of 600,000 souls, there are 14 Government and 169 private schools, scattered over the land—a number so out of all proportion that it cannot be expected that the mass of the people have even the opportunity of obtaining the slightest degree of instruction.

A provision for the enlightenment of the people by means of education, a settlement of the huks and emoluments of village officers, now before Government, and the formation of roads and bridges along the main lines of traffic, appear to me to be the immediate requirements of this Collectorate, if its amelioration and the development of its resources are sought for.

In the present absence of all roads, other than the common tracks of the country, transit of goods is altogether stopped during the four monsoon months, and for some two months afterwards the passage of the country is rendered most tedious and difficult by reason of the black soil and the numerous nullas that everywhere abound. In a commercial point of view, the road from the Bala ghaut, through Barsee and Kurmulla to Patus, is the most important: cleared through the Honorable Company's territory, this line for a distance of 15 miles, where it crosses the Nizam's talooka of Purunda, offers many obstructions. This road, should it ever be constructed, and that by which it is proposed to connect Sholapore with Indapore, will, when rendered practicable, at all seasons give an immense impetus to trade, for the Deccan rains are not so heavy as to impede the transport of merchandize.

Under the authority conveyed in Mr. Secretary Lumsden's letter No. 4342, dated 8th instant, three bungalows for the benefit of travellers are in course of erection, at an expense of Rs. 2,000 each, at the towns of Mohol, Shetphul, and Temboornee, on the road between Sholapore and Indapore; and under the last quoted authority two dhurumsalas for Native travellers, at a cost of Rs. 500 each, will shortly be built on the banks of the Bheema and Seena, upon the same line of road. These buildings will be of the utmost convenience to all classes.

Under the authority conveyed in Mr. Secretary Lumsden's letter No. 283, dated 19th January 1850, an expenditure of Rs. 1,867 has been allowed for the clearing and repairs of a large tank at Wyrag in the Barsee talooka, the townspeople having contributed a like sum towards the work, which is progressing towards completion.

For the clearing of a road of 85 miles from Dholka on the Bheema to Tungurgee on the Krishna river, through the length of the Canarese talookas, an expenditure of Rs. 3,000 was sanctioned in Mr. Secretary Lumsden's letter No. 2226, dated 31st May 1850, and my First Assistant was, on the 29th of the following month, directed to give effect to his predecessor's intentions in the construction of "a good serviceable road, practicable for carts during the greater portion of the year," submitting monthly progress reports of the work as completed. At present, carts have no existence in the southern talookas. The scheme of distributing carts, and recovering their cost by instalments, has, in the northern talookas, been attended with the best effects, and in Sholapore, Barsee, and Kurmulla, numbers are now constructed by private carpenters upon the Government model, but of rougher materials, so as to bring their cost down as low as Rs. 20 a cart.

In this Collectorate there are four ferries at which Government boats are maintained, viz. a flying bridge at each of the ferries at Teereli and Lambotee, on the Seena river, a row-boat at Wangee on the Seena, and a row-boat at Goolicwar on the Bheema. At various ferries on the Bheema and Krishna rivers, the particulars of which were submitted to you with my letter No. 108, dated 21st February last, there are thirty-seven boats and seven baskets, the property of private individuals, who have been permitted to establish them upon agreement to exact no more than the regulated fees, and to allow free use of them for public purposes. It will, I presume, under Act XXXV. of 1850, now be necessary to issue licenses to all private individuals who establish ferry boats. Their multiplication should, I think, be encouraged; for under a well-regulated system and low scale of fares, the facilities of intercommunication will thereby be greatly increased.

Annexed is my Second Assistant's report, dated the 18th instant, of the general condition of the four northern talookas under his immediate charge. To the information given in his 8th paragraph of the twelve towns which through his influence have benefitted by the municipal improvements carried out by their inhabitants, I would add the towns of Churchun, in the Indec talooka, and the seven villages of the Sholapore talooka named in the margin, whose streets and lanes are being properly constructed and drained at the sole expense of their inhabitants. The speedy promulgation of Act XXVI. of 1850 in the vernacular would, I doubt not, be attended with the best effects.

My Assistant's remarks on police, introduced in his 10th and 11th paras.,

belong rather to a judicial than a general report. The whole subject of the police of this zillah has been submitted to the Judicial Commissioner in my Report No. 353, dated the 16th August last.

My Assistant remarks in his 12th paragraph on the diminution of trees in Mohol and Mareh. The evil is one that must be allowed to correct itself, for under the rules for the guidance of local officers embodied in the Joint Report of the Superintendents of the Revenue Survey and Assessment, dated 2nd August 1847, proprietors have a full right to dispose of their trees as suits their pleasure, and all authoritative interference is to be deprecated as an invasion of private rights.

There seem to be no other points in my Assistant's report which call for remark from me; and in conclusion, therefore, I would beg to submit my opinion that on the whole the condition of the Sholapore Collectorate is progressive towards prosperity, and that in all probability its progress will be onward so long as the blessing of propitious seasons is vouchsafed to it; but, in these districts, where many possess but the necessities of life, and where the internal and external communications are defective, difficult, and tedious, an adverse year would certainly be most calamitous, and would entail distress and losses which it would require years to recover. Such a calamity, if it cannot be averted, might in a measure be alleviated, were the country intersected with roads; whereby its wants might be supplied from more favoured districts; and I think it is well worthy the consideration of Government, whether a legislative enactment might not be obtained, under the provisions of which all villages would become responsible for the due maintenance of the highways and cross-roads within their respective limits.

I have the honour to be, &c.

(Signed) J. D. INVERARITY,
Collector.

Sholapore, Collector's Coombaree, 24th October 1850.

From J. S. INVERARITY, Esq.,
Second Assistant Collector,

To J. D. INVERARITY, Esq.,
Collector, Sholapore.

SIR,

I have the honour to report on the general condition of the talookas of Mohol, Mareh, Kurmulla, and Barsee, the three former lying between the rivers Bhema and Seena, while the latter, being almost entirely surrounded by the Nizani's Dominions, is bounded on the east by the range of hills called the Bala Ghaut. The extent of these districts is about 60 miles in length, while their breadth varies from 14 to 45 miles.

The number of villages in the four talookas amounts to 368, 73 of which belong to Mohol, 85 to Mareh, 84 to Kurmulla, and 126 to Barsee, this last district being the largest and most fertile of the four. The principal towns, namely those in which a large weekly bazar is held, are Barsee, Wyrag, Kurmulla, Mareh, Temboornee, Mohol, Kurkumb, Pangree, and Keim, which may be considered the first class towns of these districts; while Angur, Nukheir, Indowleh, Patkoola, Koorool, and Karee form the second class villages, being neither so large nor so important as the first mentioned towns, of which Barsee is the principal, being most populous and wealthy, Wyrag standing in the second place.

The number of inhabitants in these districts amounts to about 275,400, as learned from the "khana somari" supplied by each village, but I do not consider this calculation to be very accurate, as I am not of opinion that the village authorities know much about taking a census. However, this amount may be regarded as somewhat approaching the real number. Koonbies or cultivators principally abound, and after them, the Mhars and Mangs probably amount to the greatest number; then come Dhungurs and Mussulmans, Brahmans and Wanis, &c. the two latter castes, except in the towns of Wyrag and Barsee, being by no means numerous throughout these districts. Agriculture is the principal pursuit of the inhabitants, and the manufacture of cloth, &c. except for home consumption, is nowhere in these districts carried on, at least to any great extent.

The main road from Sholapore to Poona, *via* Indapore, passes through the Mohol and Mareh talookas, and is not at all in a good condition, being in the rains almost impassable from mud, the black soil over which it principally runs, though making a very fair road in the dry season, being in the last degree unfavourable for the purposes of transit during the monsoon. The same remarks apply to the main road from Sholapore to Sattara *via* Punderpore, also passing through these talookas. About ten or twelve miles of the main road from Hooblee, in the Dharwar Collectorate, to Sholapore and Wyrag,

passes through the Mohol district, entering it at Beegumpore on the Bheema, and by this route a great quantity of traffic is carried on, consisting principally of sooparee, the cultivation of which being nowhere in these districts extensively practised, importation from the Southern Mahratta Country becomes necessary, to supply the wants of the people. The high road from Ahmednuggur to Sholapore passes through Kurmulla, Mareh, and Mohol, but no great extent of traffic is carried on by this route. A main road also passes through Barsee to Kurmulla and Poona, by which a very considerable quantity of cotton from the country above the Bala ghaut is carried down to Bombay, and salt brought back in return. None of the abovementioned roads are in good repair; the last named is the best, as a small sum is spent every year in clearing it, but this is totally insufficient to make anything like a road passable at all seasons of the year. The advantage to be derived from keeping the above roads in good order, and the effects which a facile means of transit would have upon the products of the country, are too obvious to require any remark. However, unless the roads are made, and regularly repaired and looked after, they, under the present state of affairs, though the main channels of communication between the principal towns in the country, will never be better than common country roads, marked out by the tracks of the carts which traverse them.

The cross-roads in these talookas are in the same condition as the main roads, being principally over black soil, and well nigh impassable during the rains. A road passes through Kurmulla, Dahiwallee, and Kurkumb to Punderpore, by which annually immense numbers of pilgrims from Nassick, Khandesh, &c. pass, to pay their devotions to the deity at the last mentioned holy city. Another cross-road, much frequented by this class of people from Nagpore and the country above the Bala ghaut, runs through the Barsee talooka by Damungaon, and thence to Angur, Papree, and Punderpore; and besides these there are numerous small cross-roads from village to village, but requiring no particular remark, being in the same condition as they have been ever since the country came into our possession. The last mentioned road by Angur formerly passed by Nurkheir, but for the last five or six years, in consequence of the difficulty of getting across some nullas near Baphleh, in His Highness the Nizam's Dominions, travellers have preferred the route by Angur, the obstructions being thereby avoided.

The wells on these roads for the benefit of wayfarers are pretty numerous, and generally in good repair, being altogether about forty-six in number; and I have not heard that anywhere on these roads is a difficulty of obtaining water experienced, even in the dry season. There are very few dhurumsalas in these districts, but as most of the villages are well supplied with chowries, I do not think that the want of them is much felt, except, perhaps, on the banks of the rivers, where such edifices would be extremely beneficial to travellers waiting for the boats to ferry them across. The sum of Rs. 1,000 has been sanctioned for building two on the main road to Poona from Sholapore, on the banks of

the rivers Bheema and Seena, and they will be completed before next rains. A bungalow has also been built on the road at Mohol, and sanction has been obtained for erecting two others at Temboornee and Shetphul, which, when completed, will be of the greatest use to European travellers. Rs. 336 have during the past year been expended on works of public utility, of which Rs. 211 were granted on account of chowries, and Rs. 125 on account of wells; the villagers themselves in every case in which such aid was granted defraying more than half the expense of the whole work.

These districts lying between two rivers of considerable size, the advantages of having good ferries across the streams, by which the internal communications of the country can be kept up during the monsoon, are obvious. Formerly the only means of passage across these rivers were gourds and baskets, but now we have considerable improvement in the means of transit. On the main road between Sholapore and Poona we have two Government ferries—at Hingungaon on the Bheema row-boats, and at Lambotee, on the Seena, a flying bridge. Again, on the road from Sholapore to Sattara there is a flying bridge on the Seena at Singolee, while on the Bheema at Punderpore there are at least thirty row-boats for the use of travellers. At Arjunsonda and Beegumpore, in the Mohol talooka, at Goorsali in the Mareh, and at Wangee and Dokree in the Kurmulla district, there are also ferries belonging to private individuals. Formerly at Bembleh, in the Mareh district, there was a basket for ferrying passengers across the Bheema, but this having now been broken up, travellers from Barsee and Wyrag to Sattara have to go a considerable round to enable them to get across this river. At Darphul on the Seena, also on the road from Wyrag to Sattara, there is a great want of a boat, and I would accordingly suggest the propriety of establishing Government ferries at both of these villages; at Awhati, also on the Seena, on the high road from Barsee to Poona *viâ* Kurmulla, I would propose to establish a ferry, by which the internal communications of the country would be greatly improved. The other rivers which intersect these districts are the Bhogawuttee, Nagderry, Koknaddi, and Teirna—all of them insignificant, and presenting no difficulties to travellers in fording them, except, perhaps, now and then for a few hours at a time during the monsoon.

A number of towns in these districts have shown a desire for municipal improvements, the example having been set by Mohol, and having been followed by the towns of Barsee, Wyrag, Mareh, Nurkheir, Temboornee, Kurkumb, Bhoseh, Goorsali, Poolooz, Patkoolee, and Bembleh; and besides these, the inhabitants of about twenty other villages are well disposed towards this means of improvement, and will probably this year commence operations, after which it is to be hoped that the example set by the large towns will be generally followed by the smaller villages throughout the country. In Barsee, the inhabitants at their own expense have built a substantial stone bridge across a nullâ intersecting their town, which must have cost at least Rs. 1,000; and

altogether the spirit of improvement appears to be abroad, and I doubt not, with a little encouragement, will shortly prevail in all the villages of these districts. The inhabitants of Barsee are, I believe, about to build another bridge, connecting the kusba with the peth, which is much required, as in the rains communication between the two is sometimes stopped by the immense quantity of water which flows down a nulla running between these parts of the town. The Kurnulla district is the only one of the four under my charge which has shown no desire for municipal improvement. Though the inhabitants of the town of Kurinulla last year signified to me their intention of beginning, as yet nothing has been done, but I hope that during the present year operations will be commenced.

There are numerous small tanks throughout these talookas, but from none of them is irrigation to any extent carried on, except from the Carcara tulao, in the Barsee district. The country generally does not abound in facilities for making tanks, and mere earthen embankments, such as are alluded to in Government letter No. 408, of 8th February 1848, would be, as far as my experience goes, of very little use, without a good stone foundation in making a tank, which would contain water for twelve months in the year. The ryots here and there throughout the country are alive to the advantages of securing the water, and now and then nullas, with large embankments to keep in the water, thrown across them, are to be found, but water seldom remains in such spots for more than three months in the year, and consequently is not of much use for the purposes of irrigation. At Wyrag, the water in the majority of the wells, after a few years, invariably becoming brackish, Rs. 1,867 have been granted by Government, during the past year, for the purpose of renewing a tank formerly built by the Pansi Jagheerदार, which had fallen into disrepair, the villagers making up an equal sum. This is now in the course of construction, and, being supplied by excellent springs, is never dry, and the water being sweet, the benefit to the inhabitants of the town when the tank is finished will be very great.

In the four talookas, 212 villages have their walls in good repair, while those of 156 are in bad repair. The gates of only 173 villages are perfect, those of the remainder being all in bad condition. Under a good system of police, I am of opinion that walls and gates ought to be perfectly useless; but in these districts, where there are no village police paid by Government, with the exception of the Police Patel, in the majority of the villages they are very useful, as they keep out robbers. The villagers, there being no Government police, are at present oppressed by the police servants whom they are constrained to keep in their own pay, called "rakhwaldars," who in most instances are themselves thieves, and are paid yearly in kind, at the pleasure of the inhabitants. Without the neutrality and connivance of these men having been first secured, robberies of any extent are never committed, from which their uselessness is evident. They profess, also, to compensate the inhabitants

for any loss they may sustain by robbery, and do so by paying them about half the amount of the property stolen, but as in these instances they themselves are the thieves, they are clear gainers of the amount they profess to pay as compensation. Such a state of things might be easily avoided, by keeping up regular village police, paid by Government, by inams of land, of which almost every village has at present a quantity lying waste; and here, also, an opportunity presents itself of improving the condition of the Zemindars, whom it ought to be so much our endeavour to upraise from the state of indifference and apathy into which they have been allowed to fall, by making them occupy prominent and useful positions in society as police officers; an employment which, as far as I can learn by conversing with them, the majority of the Deshmooks would be glad to accept. Making this officer the head of the police in a district, and allowing a certain number of Shetsundees to each village, in proportion to its size, the whole being overlooked by an European Superintendent, we would have an efficient system of police, which would render village walls and gates useless.

The proximity of the Nizam's Country, many villages belonging to which are to be found in the very centre of these talookas, affords great facilities to thieves to carry on their depredations with success, as once they are across the border there is very little chance of securing them, protected, as they are, by the supineness of the foreign authorities, who in most instances afford no assistance, but rather the contrary, in apprehending or detecting the perpetrators of any robbery, who may have been followed up into their districts. All this is an additional reason for something definite being done speedily as regards the police establishments of these districts, which, as shown in the above paragraph, are in a very inefficient state.

The number of trees in these talookas is gradually decreasing: in the districts of Mohol and March alone, there has been a diminution since last year of about 13,000 trees. Every one now takes advantage of the rules allowing him to cut down trees which have been in his possession for more than twenty years, &c. and I cannot learn that other trees are planted in their places—at least the number cut down far exceeds that of those planted. The ryots are of opinion, that the injury done to their crops by the birds which settle on trees, is a sufficient reason for their being cut down, quite forgetting that this disadvantage is counterbalanced by the benefit their crops derive from the moisture which will always exist where trees are; the springs of water being protected by their shade, and consequently not becoming dry. That where trees are, there may more abundant rain be expected, is also, I believe, a well known fact, and is proved in these districts themselves, as in the Barsee talooka, where trees are numerous, the fall of rain greatly exceeds that in Mohol and March, where trees are scanty; and where, consequently, I am of opinion that stringent rules regarding cutting down trees ought to be instituted; and that any one who cuts down a tree should be made to plant at least three in its

place ; by which means, as the number of trees increased, and water became more plentiful, the products of the country would be greatly improved.

The crops in these districts are principally rubbee, being in the Mohol and Kurmulla talooka as twelve annas out of a rupee rubbee to four annas khureef, and in the Barsee and March districts eleven annas rubbee to five annas khureef. The khureef crops consist of cotton, bajree, toor, rice, mugh, bhuimugh, oodeed, hemp, tobacco, and huldee, bajree being principally sown as an early crop. The late crops again are joaree, kurdee, gram, and wheat, of which joaree is most extensively sown. The cultivation of sugar-cane in garden land is carried on to a very considerable extent in the Barsee talooka, and in less quantities in the other three districts. Goor is principally manufactured from it, as being found less expensive in the making, and more remunerating in the selling, than sugar, which is manufactured only in one village of the March talooka, where the art was taught by Dr. Gibson's sugar-makers. No poppy cultivation is carried on, and no opium manufactured in these districts, though formerly in Ropleh, of the Kurmulla talooka, it was produced, but never to any extent, the drug not being much in favour in this part of the country.

There has been no improvement in the agricultural implements of the inhabitants for many years, the same being now in existence as were in use when the country came into our possession. Carts have, however, greatly increased in number, and are also now constructed on a much larger and more useful scale than formerly. A number of carts made by Cowasjee Nusserwanjee, the Parsee contractor at Temboornee, are to be found throughout the districts, and are most substantial and well built, the plan of them having originated, I believe, with Captain Wingate, who also got some English ploughs, and taught the cultivators how to use them ; but these latter, I understand, turned out complete failures, the hardness and roughness of the ground breaking them to pieces, and rendering them quite useless ; consequently there has been no inducement to the ryots to adopt these in preference to their own of baubul wood, which I believe to be best suited to the hard and stony soil of the country.

There are five Government schools in these districts, one in each of the towns of Barsee, Wyrag, Kurmulla, March, and Mohol, in which the Mahratta language is taught, and which I believe are attended by a considerable number of boys ; and besides these there are a number of private schools for different languages distributed throughout the principal towns of the districts. Brahmins and Wanis principally send their children to these schools, there being very few Mahrattas or Mussulmans amongst the boys. The inhabitants of these districts generally are not highly educated, and do not seem to have any taste for reading, to judge by the reception which the Bodh Sagur and Life of Nana Fudnuwis received amongst them, none of the principal people appearing to care the least about the matter contained in these books, and refusing to subscribe for them, as being of no interest. As long as they are able to keep their accounts, anything else in the way of knowledge appears to be a matter of

perfect indifference to them, and I am of opinion that any attempt at present to get up Native libraries would prove a complete failure. However, I believe that a greater portion of the inhabitants are able to read and write under the present than under former Governments, and with time and encouragement, a desire for knowledge, it is to be hoped, will at length evince itself amongst the people.

The religious prejudices of the inhabitants have, I think, in some measure declined, though this is a subject about which it is very difficult to obtain any exact information. Guzurs are now allowed to build temples in villages where Brahmins reside, which in former times was never permitted; Brahmin widows also sometimes retain their hair, which formerly was invariably shaved off—both of which facts show the decline of prejudice on the part of the Brahmins. The quarrels between the Wanis and Jains regarding the privileges of their respective castes are now not nearly so numerous as in former days. No rewards are now granted by Government to persons professing to be of peculiar sanctity, which also tends to decrease the bigoted feelings of the people, not so much influenced by their priests, whose inducement to do so has consequently become less. Still, however, great jealousy is evinced in conversing on matters of religion, and hence the difficulty of obtaining information on this subject.

Great benefits have been conferred on these districts by the introduction of the revenue survey, by which the condition of the cultivating class has been much ameliorated, some of whom are by degrees becoming capitalists, as evinced by their stores of grain, and their requiring less assistance from Government in the way of advances; but while this class has been brought forward, the men of wealth and influence of former days have been completely set aside, and deprived of the means of holding their position in society. The general condition of the country itself is also capable of much improvement, as shown in this report: roads and ferries are required, a spirit of municipal improvement has to be encouraged, dhurumsalas have to be constructed, trees have to be preserved, manufactures to be introduced, and agricultural implements to be improved; a good system of police has to be established, and a desire for knowledge instilled into the inhabitants; while the Zemindars and men of influence have to be raised from that state of apathy into which we have allowed them to fall—this last being a proceeding which, I am of opinion, would be of the greatest advantage to Government, as, though we have placed them in the back ground, their influence with the people still remains, and consequently it would be well to have them favourably disposed to us, (which they cannot be, when they compare their present with their former position,) should ever any matter of difficulty arise.

I have the honour to be, &c.

(Signed) J. S. INVERARITY,
Second Assistant Collector.

Sholapore, Assistant Collector's Office, 18th October 1850.

STATISTICAL REPORT OF CAMBAY;

COMPILED BY

MR. A. SUMMERS.

STATISTICAL REPORT OF CAMBAY.

History.—Cambay is an ancient city in the province of Guzerat, situated in the upper part of the Gulf of Cambay, longitude $72^{\circ} 48'$ E., and latitude $22^{\circ} 23'$ N.

The Collectorate of Kaira, which is also the nearest military station, is 34 miles, and Ahmedabad, the head quarters of the northern division, 56 miles north. Baroda, another military station, and capital of the Guicowar, is about 50 miles east of Cambay. The city was originally surrounded by a strong brick wall, of a rectangular figure, covering an area of 4 square miles, with ten gates, and numerous bastions mounting guns. It is now dismantled, and almost a heap of ruins; a very small portion of the walls remaining entire, and the gates presenting a ruinous aspect, affording no security to the inhabitants. Along the sea face are situated the Nawab's palace, and ranges of buildings for his principal servants, the Jumma Musjid, the British Factory, converted into a sanatorium for officers and families, and travellers' bungalow; also the Sanatorium for European and Native soldiers. A Jain temple of ancient date is more in the centre of the town. There were once many large pukka edifices in the city, but they are in a dilapidated condition: every monsoon adds to the injury effected by the hand of time. Outside the town there are two gardens, one on the north, near the Lall Durwaza, and the other near the eastern entrance; in these are erected various pukka buildings, with fountains—these are the Nawab's summer houses and resorts for pleasure. They have each a large tank, supplied by the monsoon.

The Ahmedabad river, (Saburmuttee,) after receiving the tributary streams of the Kaira rivers Seyree and Watruk, (which unite near Kaira,) empties itself into the Gulf of Cambay, about 12 miles west of the town; and the Mahee river, from the NE. of Guzerat, discharges itself into the gulf close to the town, eastward.

Governor Duncan arrived at Cambay during the Nawabship of Futteh Ali Khan, in the year 1803, with a large field force, commanded by Colonel Keating, which proceeded against Kurree, and took it. Governor Duncan remained here with Mr. Holford until the force returned to Cambay.

Rulers of Cambay.—The following is a brief account of the Nawabs who have ruled in Cambay:—

The first traceable from authentic sources is Noorodeen Mahomed, with the title of Mohmin Khan, who was the Nawab when Mr. Ware arrived as British Commercial Resident in the year 1733-34. He was the son of Meerza Jaffir Ali, Soubah of Ahmedabad, whose mausoleum is now to be seen at that city.

Mohmin Khan had a son named Khanja Meeah, who, on attaining the age of 22, was caused to be killed by his father, on account of his evil practices ; and after a protracted rule of upwards of half a century, he died on the 22nd January 1784.

He was succeeded by his son-in-law Mahomed Kooly, with the title of Najoom Khan, who married the only daughter of Mohmin Khan, by a concubine. Nawab Najoom Khan ruled only six years, having died on the 7th February 1790, leaving issue as follows :—Futteh Ali Khan, Bundah Ali Khan, and Ali Yawur Khan ; also a daughter named Boozrug Khanum, who is still living, and very old.

Futteh Ali Khan assumed the Nawabship in February 1790, and died on the 29th October 1823, leaving no issue.

He was succeeded by his brother Bundah Ali Khan, who, after exercising rule for the period of nearly eighteen years, died suddenly on the 15th March 1841, leaving issue one daughter, married to her cousin Hoosein Yawur Khan, the present ruler. Ali Yawur Khan, on the demise of his brother Bundah Ali, resigned his own right in favour of his son Hoosein Yawur Khan, and died of cholera on the 6th of March 1847, leaving no other issue.

The present Nawab, aged about thirty-five years, dates his rule from March 1841. He has for the last fifteen years, even during the lifetime of her father, lived separate from his first wife, to whom allusion is made above, and kept up an establishment of concubines, whom he retained during his pleasure. Within the last two years, however, he has contracted four niccah marriages. One wife is a daughter of the Ahmode Rajah, by whom he has no issue ; another is a daughter of Aga Gooffar, a needy adventurer, who settled here in the Nawab's employ about four years ago ; the other two are of low origin—one taken from the stables, being the daughter of a cart-driver ; and the other from the tribe of dancing girls whom he had in keeping some years. She lived in apartments in the Nawab's stables until she proved pregnant, when she went to Ahmedabad, and on her return a few months after, apartments were assigned her in the harem, where she was delivered of a son on the 11th November last, named Futteh Ali, who is now nine months old, and is the only heir to the Nawabship, that is provided the British Government would recognise the dubious claim.

The revenue of the State is made subservient to the Nawab's pleasures, no portion of it being devoted to works of public utility, schools, or charitable institutions.

His present Highness has more than perpetuated the worst practices of his

predecessors ; engaged in a round of pleasures, surrounded by companions of low origin, and retaining no less than four sets of dancing girls, with their usual train of followers, on whom he has squandered the treasures amassed by his father and the former Nawabs.

Land.—The land belonging to the Nawab extends around the city 12 miles east, along the northern bank of the Mahee 10 miles north, 18 miles north-west, and 15 miles west, to the left bank of the Saburmuttee river.

The boundary is very irregular, and there are interspersed throughout many villages and tracks of land belonging to the British, and His Highness the Guicowar. The villages of the Nawab are sixty-eight in number.

Geological Structure.—It is a part of the great central plain of India, which is generally alluvial. There are no projecting rocks, and there is scarcely a pebble to be met with.

Kunkur (kankada) mixed with sand or clay is found in large quantities from 10 to 15 feet below the surface of the soil. It is burnt for lime, which, though not of the best quality, is what is chiefly used by the inhabitants.

Natural Aspect.—The aspect of the country as far as Deesa is exceedingly flat throughout ; the scenery, however, is enlivened by an abundance of fine trees. Among the largest and most common are the tamarind, neem, peepul, bhur, wood-apple, and mango, which grow luxuriantly in Guzerat ; and the thar, which yields toddy, is confined to the neighbourhood of the coast. During the rains and cold season, the country presents a beautifully rich and verdant aspect. The country about Ahmednuggur, Hursole, and Eder, north of Ahmedabad, assumes a different feature, and is diversified by hills and valleys, approaching to the Deccan in resemblance.

Soil.—To the west and north-west of the city it is generally the black cotton soil ; but towards the east and north-east it is light and poor, but when manured, and the wet season proves favourable, it produces good crops of grain.

Productions.—The chief produce is the grain in common use in this part of the country, viz. bajree, dhangur (rice in the husk), joaree, mutt, dholl, wheat, kodra, and gram ; cotton, indigo, tobacco, and opium, are also cultivated to some extent. Wheat, dholl, and tobacco form articles of export.

Mode of Cultivation.—The mode throughout the district is by means of bullocks and the plough, and dependent on the monsoon chiefly for irrigation.

Prices of principal Products.—The prices of grain vary throughout the year in some degree. The following list exhibits the prices in 1847, after the Dewallee, in November, which is about the average current rate :—

Bajree	1½ maund per rupee.
Dhangur	1½ „ „
Rice, cleaned	2 rupees per maund.
Dholl	1½ maund per rupee.

Wheat	1½	maund per rupee.
Mutt.....	2½	maunds „
Kodia	2½	„ „
Gram	1½	maund „
Cotton, in pod	1	„ „
Cotton, cleaned.....	4	to 5 rupees per maund.
Tobacco	1	maund per rupee.

Indigo prepared, from Rs. 50 to 100 per maund, according to quality.
Opium, crude extract, from Rs. 2 to 3 per seer.

Weights.—The weights given above are according to the standard used in Cambay. The seer is equal to an English pound avoirdupois, and is divided into quarters, eighths, and sixteenths. There are 40 seers to the maund, and 20 maunds to the candy.

Tenure and Occupation.—A small portion is held as inamee land, and the rest is let out annually by the Nawab in smaller or larger quantities : the lease is in no instance understood to extend beyond the year.

Modes and Rates of Assessment.—The produce of the black soil is generally wheat and cotton. Half of the wheat grown goes to the Nawab, and the remaining moiety belongs to the cultivator. There is no fixed mode or rate of assessment on cotton, and very little is grown, the tax upon it varying according to local circumstances. The light soil, producing bajree, rice, &c. pays a stipulated rate in money, the best land paying generally Rs. 5 to 7 per beega. The second is rated from Rs. 3 to 4, and worst from Rs. 1 to 2 per beega.

Labour employed, and its Remuneration.—All the land is subjected to the plough, and manured. The amount of labour is great, and extends from the middle of June to the end of October ; the remuneration is scarcely enough to be called an adequate return. From October, a large proportion of the agricultural population, with their carts and cattle, are employed during the dry season in conveying private stores and merchandize to and from the bunder ; others, again, in conveying merchandize and private stores to the interior, as far as our last military station, Deesa. Numbers, too, are employed on the rough part of the work in the different cornelian manufactories.

Navigable Rivers and Lakes.—In the interior of Guzerat there is not one navigable river, nor is there a single expanse of water deserving the name of a lake.

Canals.—There is an old canal or drain which used to empty itself into the Narrainseer tank : when and by whom it was cut I cannot well ascertain, as the popular accounts of it are as conflicting as they are ridiculous. There are several drains cut through marshy parts of the country by the British Government, one of which passes through the Nawab's territory ; it fills a large tank at Neeja, and another in its course, and after supplying the Narrainseer tank by means of the ancient canal, finds an exit into the Gulf. These canals

or drains are intended for draining the marshy country flooded by the monsoon, and are consequently quite dry after the wet season.

Tanks.—There are several fine tanks in the neighbourhood of the city. Narrainseer, when full, presents a beautiful expanse of water: the Nawab has his best garden and summer houses on its borders. Madlah Baugh yields only to the former: near its southern bank is erected the bungalow formerly occupied by Major Rennell. Neeja and Nutawa are extensive tanks a few miles from Cambay; and every village has its tank, (one or more,) supplied by the rains.

Wells, and means of Irrigation.—There are not many wells, particularly in the black soil district: the agriculturists' chief dependance for a supply of water is on the monsoon, which is generally abundant. A second crop may be produced in the dry season, which is generally done on limited patches in the neighbourhood of villages, when water for irrigation is raised from wells by means of large leather buckets, attached to ropes and pulleys, and drawn by a pair of bullocks: the water is emptied into a reservoir, from whence it flows into drains leading to the lands under cultivation.

Harbours, and Shipping frequenting them.—The harbour might have been more safe and commodious were it not that its bed near Cambay is constantly shifting, through the force of the under-currents, caused by the contending influences of the streams from the Sabarmuttee and Mahee, as also by the tides. The quantity of mud brought down during the rains by the rivers has probably something to do with the deposits and changes, which I shall presently notice as having occurred under my own observation.

Some years these changes are nothing more than the filling up of the frequented creeks, and excavation of others at some distance; at other seasons, and at longer intervals of occurrence, the whole bed of the harbour for several miles is completely washed away to a considerable depth, the bank falling in in ponderous masses. When this takes place boats take up their position within a quarter of a mile from the town, and the channel is of such depth that the hulls of the vessels are hid by the embankment when the tide has receded. The filling up again is more gradual: the deposit is laid down slowly, till, in a few years, a scarcely perceptible shelving bank extends for miles away from the old channel, and boats are obliged to anchor as far as three or four miles from the town. The ebb tide recedes to a considerable distance, leaving the boats dry for several hours, during which time passengers are enabled to land, and stores are disembarked.

The Gulf of Cambay has been gradually filling up for some years: the tide, or what was termed the bore, used to rush in in a large volume, with amazing velocity and a roaring sound—its approach was earlier cognizant by the sense of hearing than by vision: this gave warning to the boatmen to be prepared. Its force and volume have been much diminished, owing, I believe, to the above cause.

The Gulf is navigated by country craft of from 30 to 200 candies burden, which arrive from Bombay, Surat, Broach, and other ports along the coast, with passengers and merchandize. The passage is rendered tedious when contrary winds prevail, extending sometimes to fifteen days, which tedious process of transit would be obviated if a steamer or two were established on the line of coast extending to Cambay, to run twice a month, which would be practicable during the springs of the full and new moon. Its influence holds out about six days. It would, I am convinced, yield a good return, as European and Native passengers and merchants would doubtless be glad to avail themselves of such an accommodation.

The breadth of the channel of the Gulf in the SE. quarter of the town is at the widest part 10 miles, decreasing as it extends to Dhewan and upwards. The spring tides flow as far up as Veera Wassud, 30 miles inland, filling the whole channel from bank to bank, and presenting a fine expanse of water; but during the neap tides the stream is quite insignificant, and covers only a part of the channel. In the bed of this arm of the Gulf the river Mahee flows, less than a quarter of a mile in breadth, and impregnated with saline matter, rendering the water unpalatable.

Atmosphere and Climate.—The climate of Cambay is more equable in temperature than stations in the interior of Guzerat, and from its position enjoys the influence of the sea breeze, which exerts a beneficial influence on diseases in general, save in cases where a strumous diathesis exists, giving rise to glandular affections, but which are only developed when a humid atmosphere prevails. Its effect on invalids after fever, rheumatic affections, and cachexia, the sequelæ of fever, was most remarkable in two instances when large numbers of sick were brought under its influence. On the 12th March 1837, 98 invalids of the 17th Regiment N. I. arrived here from Hursule, 83 suffering from fever and spleen, the others from rheumatic affections and cutaneous diseases; in the end of March 14 more were admitted, making a total of 112. Of these only 1 died in April, and by the end of May, with the exception of 5 cases, the whole were discharged well to rejoin the regiment: the 5 cases detained here for further treatment during the monsoon were discharged well in October.

The other instance on the records is 77 invalids of the 2nd Grenadier Regiment N. I., who were sent here from Baroda in the month of January 1847. Of these 68 were cases of fever, its sequelæ, and rheumatism, 1 case of phthisis, and 8 cases of foul indolent ulcers contracted in Scinde. The only death was the case of phthisis; 31 were discharged well in February, 25 in March, and the remaining 20 in April.

To enter into minor details of the beneficial effects of climate on the sick officers and soldiers treated here would take up too much space; I will therefore advert to the meteorological register, exhibiting from it the mean of each month for three successive years, viz. 1845, 1846, and 1847, which I have

given by adding up the minimum of each month for three years, and dividing it by three ; and the same way with regard to the maximum :—

Months.	Thermometer.		Wind	Weather.
	Three Years' Mean of Minimum.	Three Years' Mean of Maximum.		
January ...	53°	85°	Steadily NE.	Morning cold and hazy, occasionally clear ; day warm ; evening cool and pleasant.
February..	53	86	Morning NE., veering to S. and SW. in the evening.	Morning, early part cold and clear, afterwards cool ; mid-day warm ; evening and night pleasant.
March ...	62	91	Variable	Morning cool, occasionally hazy ; mid-day sun hot ; afternoon often stormy ; evening cool ; night cool.
April	66	96	Variable, nearly from all points.	Morning pretty cool ; day hot ; thunder and dust-storms frequent, with a few falls of rain ; night occasionally warm.
May	76	97	Generally S. and SW.	Ditto ditto ditto, with high winds.
June	78	94	Strong, SW.	Early part of month hot and oppressive until setting in of monsoon from 10th to 20th, ushered in by thunderstorms and lightning ; rain heavy, when weather cools.
July	77	89	Ditto	Generally wet and cloudy, with thunder and lightning, and occasional breaks of sunshine.
August .	77	88	Ditto	Ditto ditto ditto.
September.	77	89	S. and SW.	Much less rain ; weather becomes hot, and monsoon terminates ; fever becomes prevalent.
October .	71	93	Morning generally NE., evening S. and SW.	Morning generally cool, occasionally hazy ; day hot and oppressive ; with closeness in the early part of the night.
November.	62	88	NE.	Morning cool, hazy, occasionally clear ; day warm ; evening pleasant, with occasional dews at night.
December..	55	86	Ditto	Ditto ditto ditto.

Sanataria.—The Sanatorium or Factory was originally the British Commercial Residency. As far as I can trace the history from authentic sources, the British flag was first hoisted here about the year 1733-34, when Mr. Ware was deputed as British Commercial Resident, prior to which, for a series of years, the Honorable East India Company traded here by paying a per-centage on merchandize, and about the year 1705-06 a grant of free trade was obtained by the Honorable Company from the Emperor of Delhi, in consideration of paying annually the sum of Rs. 10,000.

The following is a list of the British Residents at Cambay in regular succession, exhibiting also the names of the Nawabs:—

Name of Resident.	Period of Occupancy.	Ruling Nawab.
Mr. Ware	Up to the year 1735	Mohamm Khan.
Mr. Munro	From 1735 to 1742	Ditto.
Mr. Scales	During the year 1743	Ditto.
Mr. T. Hodges ..	From 1744 to 1746	Ditto.
Mr. C. Crommelian	From 1746 to 1753	Ditto.
Mr. R. Eiskine ..	From 1754 to 1757	Ditto.
Mr. J. Stracey ..	From 1758 to 1760	Ditto.
Mr. W. Boye	From 1761 to 1763	Ditto.
Mr. W. Raykes ..	One year, 1764	Ditto.
Mr. J. Torlesse ..	From 1765 to 1773	Ditto.
Sir C. Malet	From 1773 to 1783	Ditto.
Mr. R. Holford ..	From 1784 to 1803	Mohamm Khan, Najoom Khan, and Futteh Ali Khan.
Mr. J. Smith	Within a year, 1804	Futteh Ali Khan.
Mr. R. Holford ..	Within a year, 1804-05	Ditto.
Mr. J. Corsellis ..	From 1805 to 1810	Ditto.
Mr. Julian Screen	From 1811 to 1815	Ditto.
Mr. B. Doveton ..	In the year 1816	Ditto.
Mr. G. Moore	In the year 1817	Ditto.
Mr. R. Boyd	In the year 1818	Ditto.

In the year 1818 the Commercial Residency at Cambay was abolished, and the trade discontinued.

When the Commercial Residency was abolished in 1818, the building was engaged by Government from the family of their former broker Eduljee Cowasjee, of Cambay, at the monthly rent of Rs. 150, and converted into a travellers' bungalow. For many years after this, sick officers coming here from the interior could obtain no medical aid, and this want in many instances was sadly experienced, which induced the Government to sanction an Apothecary for this station.

The Medical Board selected me to fill this situation. I was appointed in November 1834, and arrived here in February 1835; since which period I have discharged the duties here, save when my services were temporarily required to fill other trusts, which took me once to Ahmednuggur, in the Mahee Kaunta, where I held medical charge of a large field force, twice to Kaira in charge of the Civil Surgeon's duties, and medical charge of the Provincial Battalion, besides other charges, which would be out of place to note here, always returning to Cambay after being relieved.

In 1836, Government directed that all travellers should pay a tax of Rs. 1 officers with families Rs. 2 per diem, and sick officers 8 annas. The rooms denominated the Collector's were those expressly set apart for the accommodation of sick officers, the other part of the building forming the travellers quarters. This regulation still obtains.

Sick officers and families resort to Cambay from Ahmedabad, Hursole, Baroda, and Kaira, but during the unhealthy seasons, before the onset of the monsoon, and after its close, the rooms for the sick are seldom available; they are then accommodated in the apartments allotted for travellers—often in the lower rooms, the least exposed to the beneficial influence of the sea breeze.

Distinct from the above there is another hospital, established since March 1837, for the accommodation of European and Native sick soldiers, who may be sent here from Ahmedabad, Hursole, Baroda, and Kaira, for which Government pays a monthly rent of Rs. 25. The desirableness of Cambay as a sanatorium I have before adverted to under the head of climate.

Government Treasury.—Within the factory is a strong apartment for the treasury, where the money raised from the Nawab, (the chouth,) the sea customs, and other sources, is periodically received and deposited: when the amount exceeds Rs. 3,000 the money is sent to the Boissad treasury, in charge of a guard furnished from thence.

There is an establishment of a Mamlutdar, pay Rs. 88; a Karkoon, Rs. 23½; a Shroff, Rs. 4; a Mussal, Rs. 4; and six Peons, attached to the treasury. The Mamlutdar having no magisterial duties whatever to perform, the treasury is his sole charge. The Karkoon under him keeps all the accounts, and is perfectly well acquainted with the duties.

There is no chance of peculation, as the treasury is examined on the 1st of every month by the medical officer, who sends in his report to the Collector of Kaira.

Villages.—There are 68 villages belonging to the Nawab, most of them situated to the west, north-west, and north of Cambay. Only three can be estimated at 1,000 houses each; the others are small, numbering from 60 to 300 houses. They can boast of very few pukka buildings: the habitations are chiefly constructed of brick and mud—many of them but wretched hovels.

Number of Houses, whether Pukka or Kucha.—The houses in some parts of the town are densely crowded, forming ranges of narrow streets in the Hindoo quarter. As far as I can ascertain from the heads of the different castes, and various other sources, the number is computed as follows:—In the city, Mahomedan houses 6,000, including 200 houses of Borahs; of Brahmins 3,000, Bunniahs 2,000; Koonbies 2,000; Fishermen 1,000; Koolies 500; Dhers and Wagries 500; making a total of 15,000. There are no very good houses; those of ancient date are fast crumbling to decay.

Population.—The population of the city is unequally distributed, the Hindoo quarter being densely inhabited, while the others are more scattered. The Nawab will not permit any census to be taken, but as far as my means would permit of forming an estimate, the Hindoos in round numbers may amount to 30,000, and Mahomedans to 20,000, including 400 Borahs, who reside in a

distinct quarter of the town, and about 100 Persians and Arabs. There are also about 30 Parsee families in Cambay.

Employment.—The Hindoo population is divided into manufacturers of cloth, workers in the cornelian manufactories and salt-pans, merchants, bankers, Banyan shopkeepers, Brahmins, and operators of different trades. Of the Mahomedans, a large number are nominally servants of the Nawab, on a small pittance, others are employed on the gates, and as police; some are employed in the cornelian and carpet manufactories, others in weaving cloth. A great many follow no trade, but act occasionally as servants to those in better circumstances. One-half of these are very poor, yet too proud to earn an honest livelihood and improve their circumstances. The Borahs have a few shops, about fifteen in all: a good number of this class have houses here, where their families reside, while they carry on traffic in Bombay, Mocha, and China.

The Parsees have the contract for distilling and vending of spirits; they employ themselves also in weaving.

Language.—The Guzerattee is the chief language spoken by the Hindoos; by the Mahomedans Hindoostanee and Persian: this latter is more in vogue amongst the Moguls.

Condition.—The generality of the population are very poor: the chief trade is in the hands of the Hindoos, and even among these few possess a capital exceeding Rs. 10,000, in consequence of the monied men having left this port to open trade in our free ports. One-half of the Mahomedan population eke out a wretched living by the labour of the female portion of their class, who employ themselves in cotton spinning.

Education, and Method of pursuing it.—There are two private Persian schools, attended by 15 or 20 scholars in all at one time. The master receives a rupee or two monthly from each scholar. The vernacular or Hindoo schools are numerous, generally under a shed, or on a raised spot in front of a house. The scholars, mustering from 15 to 30 in each school, bring each a handful or two of grain daily, and when the term of study is closed, a rupee or two is given to the teacher. This is his only remuneration. There are no public charitable schools here.

Charitable Institutions, not Educational.—Cambay does not boast of a single charitable institution, unless a Hindoo Majain building for the admission of sick or otherwise helpless cattle and birds can be denominated such, which is entirely supported by the Hindoos.

State of Litigation and of Crime.—Crime of a serious character, involving murder, is of rare occurrence. A few casual instances among the Moguls have arisen from quarrelling; in other instances women and children have become victims for the ornaments about their person. Investigation into such cases is seldom instituted. Suicide by means of opium or mineral poison occasionally occurs, traceable to quarrels and jealousy, amongst the Mahomedans. Crime of an inferior degree, amounting to burglary, robbery, and peculation, are very

common in the town and districts. The police are very lax in the discharge of their duty. Litigation is seldom resorted to, for want of efficient magisterial authority. Corruption in the administration of justice pervades the whole department. There are two judicial functionaries, who are paid servants of the Nawab—the Native Judge, or Adawlut Officer, whose salary is Rs. 50, and the Kotwal, or Magistrate of Police, on a salary of Rs. 30 per mensem. Each of these officers receives daily provisions. The small remuneration will go far to account for the lax and corrupt administration of justice.

There is also a Kazee employed, whose salary is Rs. 30 per mensem, for deciding on questions of Mahomedan jurisprudence, registration of marriages, and deeds of sale or transfer of houses or lands, who also levies a fee for affixing his seal to these documents.

Police: Number, Remuneration, and Efficiency.—A Kotwal is at the head of the police establishment, which numbers 150 men. The salary of the latter is Rs. 4 each per mensem, but this is always allowed to run in arrears from eight to eighteen months: when payment is made it is not in full, as five months' wages at least are invariably kept in arrears, and again allowed to accumulate. This system is pursued with all the Nawab's inferior servants, who are obliged to borrow from the Banyans at high interest. Men paid in this fashion become careless in the discharge of their duty, and consequently inefficient; but on the other hand, oppression and extortion are indulged in with impunity by them, towards the unfortunates who happen to fall within their power.

Health and Disease.—Cambay being situated within the influence of sea breezes, and not being subject to extremes of heat and cold, enjoys a more equable temperature, and a milder climate throughout the year, and is comparatively healthier than stations in the interior of Guzerat. It is also more exempt from the severer character of remittent fever and coup-de-soleil, enjoying an immunity from many diseases peculiar to other climates; but fever is its bane.

Fever.—Fever of the remittent and intermittent types is the most prevalent disease in Guzerat, the latter almost throughout the year, and the former in the months of April, May, June, September, and October. In some seasons the character of the remittent takes a severe form, being complicated with acute liver affection, and always with deranged stomach. If properly treated the patient quite recovers; at other times it assumes the intermittent type, and recovery is protracted to many months. It is very common in passing through villages to see some squalid objects in a cachectic state, with loss of all nervous energy, countenance sickly and bloated, with protuberance of belly and wasting of the frame, save the feet, which are generally swollen. On inquiry into their case, it will generally be found that they have been suffering from ague and fever for many months, complicated with enlarged spleen, often enlarged and tuberculated liver, loss of functional energy of cellular tissues, dropsy either present, or the disease fast verging to that state. This is very common in the

villages, having its origin from many sources. When fever is set up, it is badly treated, and the men work under its influence, alternately exposed to sun and rain; their food is wretched, and they are badly housed. Under this train of causes, the disease runs its course from bad to worse, until death steps in to relieve the sufferer from his misery.

Cholera.—This hydra-headed disease, which exerts its baneful influence throughout India with more or less severity, is more mild in its ravages in Guzerat. The year 1847 must be excepted, when it broke out with fearful violence, under the following circumstances :—

A rich Hindoo of Ahmedabad, who had amassed immense wealth from extensive opium dealings, left a large legacy for the building and endowment of a Majam or Shavuk temple at Ahmedabad, at the consecration of which about 100,000 Hindoos had assembled from all parts of India. They were some weeks in congregating, and on the day of consecration, viz. the 11th February, cholera showed itself among this mass of human beings.

The authorities directed their dispersion the following day, our camp being situated near to their encampment. The disease spread with fearful violence, and was disseminated into every village and town through which the mass diverged, causing fearful havoc among themselves and inhabitants in the various districts. No estimate can be formed of the destruction of life, and in a month, too, when cholera is never known to prevail as an epidemic. On this occasion Cambay suffered more than in any preceding year for thirteen seasons to my knowledge, numbering 26 deaths in two days among those returned from Ahmedabad and their families.

In anticipation of this, the returning parties were directed to remain outside the town in quarantine, but owing to the want of efficient control, numbers came into the town, and spread the disease here, whence it was not eradicated for a month. At other seasons, when the disease is committing serious ravages at Ahmedabad, Kaira, and their vicinity, Cambay enjoys comparative immunity, or is but slightly threatened: at such times our daily deaths average from four to eight for a couple of days, falling off in number daily, and disappearing in about a fortnight.

Numbers of Natives die from this disease, owing to the apathy evinced by their friends in allowing it to run into the collapse stage before they think of applying for remedies.

When the disease rages as an epidemic, the months of June, July, and August are particularly favourable for its development. It occasionally appears in April and May, when it is not characterized by any degree of severity. Often for a year or two consecutively Guzerat enjoys a total immunity from its visitation.

Spontaneous Amputation.—In connection with fever, I will here detail a most interesting case of spontaneous amputation of the lower extremities, effected entirely by nature unaided by art. A case of this description is of such rare occurrence that it is worthy of being placed on record :—

In the year 1836 I was called upon to visit a female patient of the Hindoo caste, aged about 22 years, and wife of a Dullal. I was told that she had been labouring under fever for about a fortnight, though free from it for a few days previous to my first visit. She was considerably emaciated, and there was great prostration of strength. The lower extremities presented the following appearance:—Both the feet, from the toes to about three inches above the ankle joints, were discoloured, of a livid tint, dry, and shrunk, and totally deprived of vitality; the sphacelated parts were here defined and terminated, and completely separated from the living tissues above, leaving the bones of both extremities exposed for about an inch, which were of a dark colour, and I could perceive that nature was here too completing her work, by causing a separation of the dead from the living part. The separation, I was told, progressed so far without any hæmorrhage. I watched this case with much interest, and was anxious about its favourable termination. Two days from my first visit the bones were completely divided, leaving two healthy stumps, and the salutary process of granulation was progressing favourably. Three days from this period, I was sorry to find that the patient had expired, from extreme exhaustion.

My endeavours were confined to seeing to the cleanly state of the sores, and supporting nature under such a severe trial. Here I had difficulties to contend against on account of caste, and I was obliged to practice deception with her friends, (and save her life if possible,) by giving her bark and wine, and chicken broth, sent in bottles as medicine, the administration of which they were careless about, and exhausted nature required more than their meagre fare supplied.

I cannot help, however, stating it as my belief, that had I had other than a Hindoo patient and her friends to treat with, I would have had a happier termination of the case to record, considering how favourably the case was progressing.

My endeavours to obtain the severed members were quite unsuccessful; they were in a fine state of preservation, perfect in all their parts, though shrunk and dried up.

Cambay Boil.—Peculiar to Cambay and Broach is an unhealthy and intractable ulcer, known among the Natives by the name of usrafee, and by Europeans called the Cambay and Broach Boil. The ulcer commences in the shape of a small pimple, slightly raised and discoloured; this goes on increasing, giving little pain or exciting attention for a week or month—all this time the epidermis is unbroken. It then assumes an inflammatory appearance, is much raised and indurated, and emits a discharge from several points. The ulcer goes on, gradually covering a larger surface: at times a free discharge issues from it; at other times it appears to dry up, leaving a scaly cicatrix, and you fancy the ulcer has healed. Presently from some cause it again becomes irritable, and after poulticing, or otherwise softening it, the scaly cicatrix or

scab is removed, and an unhealthy honey-combed ulcer is exposed, with indurated base and edges, which goes on spreading and undermining the cutis. The virus of the disease is deep-seated, and, if not properly treated, it runs its course, and exhausts itself after several months or a year, leaving an indelible mark behind to the extent of the sore, sometimes as large as a crown-piece. The face, hands, and arms, are the chief places it attacks. The ulcers are sometimes single; often as many as six break out at the same time. The inhabitants, although in apparent health, and free from any ailment, are subject to the disease, but only once; and strangers who reside here for only a week or a month are not exempt from its attacks, the disease showing itself after they have left the place; and I have for years received frequent applications from the interior for the ointment, since it has been known to effect a cure.

I was for some time baffled in my attempts at cure in the various remedies I tried. My perseverance was at last crowned with success, and I have since cured a great many ladies, gentlemen, and Natives in the early stage of the disease with an ointment in which iron and nitric acid form component parts. When the disease is cured early, the mark left is small. In the old and intractable ulcers, I use the potassæ hydras to destroy the indurated surface; the ointment then acts beneficially in promoting the cure. Internal remedies, such as occasional aperients and alteratives, are only necessary when the general health has suffered from this or other causes.

Conclusion of Medical History.—The limits of a report of this nature, where other subjects have taken up so much space, will not permit of any lengthy remarks on the other diseases prevalent here—not many in number; I will therefore make a few passing observations on some of them.

Catarrhal affections, with some degree of sympathetic fever, are prevalent from October to the month of January, yielding easily to mild remedial measures.

Diarrhœa and dysentery prevail chiefly during the monsoon months, but not in a very severe form, and is readily subdued by the usual means resorted to. Rheumatic affections are not very prevalent. The few cases brought occasionally under my notice are generally strumous subjects, which yield to preparations of iron, iodine, colchicum, Dover's powder, and tonics, and, if a necessity exists, leeching and blistering.

Dropsies in the town are rare, but more common among the village population, being the sequelæ of fever, spleen, and liver affections. During the wet season there are always stagnant swamps, impregnated with deleterious matter, in the neighbourhood of villages. This is the ordinary exciting cause of the fever, generally intermittent. A diseased state of the system, and consequent deranged secretions, is maintained by the same cause, and, combined with their being badly housed and scantily clad, leads to a train of derangement terminating in dropsy. It is sad to witness these cases, where you can administer

only temporary relief, for they can scarcely be prevailed upon to come to the town for the purpose of undergoing a course of treatment.

Measles and small-pox prevail among the children in the months of April, May, and June—the latter not to any alarming extent, as vaccination is practised, and the inhabitants of the town are fully sensible of its beneficial effects.

Commerce, Manufactures.—The chief articles manufactured at Cambay are the following :—

Cloth.—Dark cloth, or kalla kupper, named nameanee or loongee, panch putty, gurbee, and kusbee. Very large quantities of these are manufactured here for the Mocha and Jedda markets by the Katrees and Koonbies, not agriculturists. Other cloths for Cambay consumption are also manufactured here, such as ghat (silk), dhoties, gagrapat, sarries, pugries, duputta, bhasta, &c. giving employment to a large number of people of different castes, and maintaining a fair marketable price.

Cornelians.—This article stands next in importance. There are several cornelian manufactories in the town, giving employment to about a thousand hands. The articles manufactured are models of cannon complete with carriages, chess-men, cups and saucers, knife-handles, slabs for boxes, necklaces, brooches, seals, armlets, bracelets, paper-weights, paper-cutters, pen-holders, beads, &c.

At the village of Tunkurra, near Rajcote, Mandwah, and Kupperwunge, are situated the principal quarries, which yield the bloodstone, moss, and other agates. The Bheels of the country are the quarrymen who collect and sell the stones in the rough state to the heads of manufactories. The cornelian pebbles are procured in villages in the Guicowar States, named Nemodra, Rajpeeplee, &c. A few Banyans at Nemodra enter into contract with the Guicowar authorities to pay Rs. 2,000 annually for permission to work the mines, for excavating which the contractor employs Bheels of the country. The process is conducted on the principle of mining operations, having supports and air passages.

The collecting, exposing to the sun, baking, and preparing the rough stones for the Cambay market, is performed by the contractor, through the means of the Bheels employed for these purposes. The stones are then disposed of to the manufacturers of Cambay.

Carpets.—There are four principal manufactories. The superior carpets made to order are of fast colours, striped alternately red and blue. The blue dye is prepared at Cambay, and extensively used in the manufacture of coloured cloth ; the red cotton thread is prepared in the Broach districts, and brought here, where it meets with a ready sale. Cambay has been long famed for its carpets, which for texture, colour, and durability, excel the Ahmedabad manufacture. The red dye (soorunjee) imported from Malwa and Bombay is generally used for colouring ; the market price of it is about Rs. 6 or Rs. 8 per maund.

Salt Manufacture.—The salt-pans extend for upwards of a mile on the sea face of the town. During the spring tides the sea water is received into large reservoirs, whence it is distributed into the salt beds by means of smaller channels of communication, which, again, are closed up. The salt deposited after the evaporation of the water is collected by the fishermen employed on the works, and sold under the superintendence of Karkoons and Peons, at the rate of 14 annas per Bengal maund, equal to two Cambay maunds. Of this amount, 11 annas and 10 pie are divided between the Nawab and British Government in equal shares; and the remaining 2 annas and 2 pie on each maund go to the fishermen. No other tax is levied upon salt in its transmission to markets in the interior.

Indigo.—The indigo plant is grown on light soils in several villages near the town. The seed is sown in June, and the plant is ready in September, when it is cut, leaving about a foot of the stalk in the ground. The plants having been brought by carts to the manufactories, called kotahs or jundiahs, are placed by the Wagries (the people employed on the manufacture) in layers in the cisterns. Weights are then laid over them. They are in this way subjected to maceration for one night. The colouring matter being deposited, the plant is removed; the residue is strained, and the water allowed to drain away. The deposit is made up into small cakes for the market. The process of preparation takes up three days.

Indigo pays a high duty, and is sold at the rate of from Rs. 50 to Rs. 100 per Cambay maund, according to quality, and state of the market.

Opium.—Opium is only grown in a few fields, and the produce is very small—not sufficient to meet the demand. A large quantity of this baneful drug is consumed here by the Mahomedan population, from the ruler to the lowest class, who take it in the mass, as also made up into a liquid potation.

As regards the sale of opium in the town, a merchant contracts with the Nawab's authorities to pay annually from Rs. 1,000 to Rs. 1,300, who retails it to the vendors of the drug; the contractor also pays Rs. 96 annually to the British Government.

Capital employed.—The amount of capital employed cannot be elucidated with any degree of accuracy, but the trade has been falling off for the last twelve years, on account of the heavy duty at Cambay, and the opening of other ports, which offer more inducements to traders to resort to them. It is at present estimated at one and a half lakh of rupees annually on the manufactures.

Imports.—The imports are chiefly from Bombay and adjacent ports, and consist chiefly of Europe piece goods; spirits, wine, beer, tea, sugar, jagree or coarse sugar, cocoanuts, oil, and other articles of consumption; also timber, rafters, and bamboos. The duty levied on all goods imported is, on the part of the British, Rs. 1-12-0 per cent., and on the part of the Nawab Rs. 3-4-0

per cent., and an additional duty, termed mookat, of Rs. 6-12-0, is levied by the Nawab upon all articles of consumption, such as tea, sugar, dates, grain, cocoanuts, &c.

Exports.—A large quantity of cloth is exported from Cambay, denominated kalla kupper, made up into large bales, and shipped to Bombay and Veravul bunder, for transhipment to Mocha and Jedda. Cornelian forms another extensive article of export annually. It is shipped to Bombay in chests, for the Bombay, China, Mocha, Bussorah, and Scinde markets. Next in importance are tobacco and soap. The former is the produce of lands near Cambay, and the latter is manufactured at Kupperwunge in the Kaira zillah, and shipped here to Bombay and ports adjacent.

Exchange.—The fixed rate of exchange in transactions with the British Government is Rs. 14 per cent. below the standard value of the Company's rupee (*i. e.* 100 Cambay equal to 86 Company's rupees). In the market the exchange is always fluctuating.

Coins.—The coinage current in ordinary transactions is issued from the Nawab's mint, falling considerably below the Company's standard, and consists of one, half, and quarter rupees. The coining is farmed out to a Native, who makes the most of his contract by the free use of alloy. The copper coin is the pice and half pice. Wretched productions they are.

Banking.—The only banking transactions here are by means of hoondies. Five Native Soucars conduct this business on a small scale, whose credit individually seldom exceeds Rs. 1,000.

Lending and Borrowing.—This is common enough on a small scale in Cambay, the lender generally receiving ornaments or other valuables in pledge to more than the full value of the sum he risks, exacting a premium, and charging a high rate of interest, ruinous to individuals unable to redeem the pledge within the limited time.

Postal Arrangements.—A district dawkh has been established here for the last seven years in connection with the Kaira Post Office, and is conducted by the Native treasury Karkoon, where letters to any station are received on prepayment of the extra district postage of half or one anna to Kaira, as the letters come within a quarter or one tola weight. The packet is sent to Kaira, where it joins the regular line of post. The same rate of extra postage is levied on all letters passing through the Kaira Post Office to Cambay.

Modes of Transit and Communication. By Land.—The transit into the interior is by means of carts. The first cart that goes after the opening of the season in September cuts a way for itself through fields, or wherever else it can find a passage: all the carts throughout the dry season follow in this track. The cultivators hedge in their fields at the commencement of the monsoon, and plough up the roads, so called. There is no made road in Guzerat save near military cantonments.

By Water.—The transit of merchandize, &c. by water is by means of country

boats of from 30 to 200 candies' burden, to the different ports on the line of coast towards Bombay, and to the Presidency itself. Out of this line Cambay does not boast of any direct commercial transactions.

Impediments, and their duration.—From three to four months in the year, during the prevalence of the monsoon, all communication as regards transit of merchandize is cut off both by sea and land. During the dry season the transit of merchandize and private property is rendered unsafe, from frequent robberies perpetrated by the Koolee tribe; but when these people are engaged as a guard, which is always necessary, the property is considered safe.

Fords, Ferries, and Bridges.—Within the Nawab's district there is neither ford nor bridge. There is a ferry from Cambay to Cavee, a village on the opposite coast, in the Jumbooseer district. Passengers crossing over from Cambay pay a tax of 5½ annas; those arriving from Cavee pay 1 anna each to the ferrymen. Boats ply across daily at high water.

Taxation.—Under this head may be enumerated a tax upon houses fronting the streets, on second marriages, and divorces, which are common. A tax upon all operatives, not in money but their labour: a register is kept by the head of each class of men engaged in any trade or occupation, who furnishes any number required daily by the Nawab; the remainder is portioned out to work in the town, whose earnings in the evening are divided equally with the men employed on the Nawab's work. In this way an indirect and indefinite, but a grievous tax, is laid upon all the inhabitants, who, through the high wages demanded by artificers, are virtually compelled to pay for all the work performed for the Nawab. The land tax and customs duty will come under the head of revenue.

Sources of Revenue, and Produce of each Tax.

SEA CUSTOMS.	1831-35.			1837.			1847.		
	Rs.	a.	p.	Rs.	a.	p.	Rs.	a.	p.
Customs. { Import	10,036	9	10	6,710	2	10	5,611	11	4
{ Export	5,315	7	10	7,579	3	4	6,066	12	7
Sundries, termed Rhesgee, import and export	471	10	1	385	6	10	139	11	5
Anchorage Fee	10,900	8	11	1,737	0	4	835	11	6
Other minor Fees, not included in the above	183	8	6	107	15	5	21	2	10
Ferry Fees . . . . .	*	....		*	.....		70	0	0
Total	26,910	13	2	16,519	12	9	12,745	1	8

* Included in anchorage fee.

Sources of Revenue (continued).

LAND CUSTOMS.	1834-35.			1837.			1847.		
	<i>Rs.</i>	<i>a.</i>	<i>p.</i>	<i>Rs.</i>	<i>a.</i>	<i>p.</i>	<i>Rs.</i>	<i>a.</i>	<i>p.</i>
Land Duty... { Import	804	11	6	5,857	1	0	881	4	1
{ Export	308	7	0	1,716	7	2	471	0	10
Sundries, termed Rhesgee, import and export	156	13	0	100	8	6	138	15	9
Formerly taken by Karkoons	686	7	1	107	11	9	12	11	5
Articles farmed, such as Vegetables, Fruit, Ghee, &c.	4,306	2	2	Included in 1st line.			5,032	0	0
Duty Radaree Village, Naka Goolanah..	825	0	0	734	13	10	720	6	6
Import, small articles	160	12	0	24	4	0	.....	
Salt duty, export	1,887	7	11	.....			.....
Total ...	9,135	12	8	8,541	1	3	7,256	6	7
Total of Revenue, Sea Customs, and Land Duty	36,016	9	10	25,060	14	0	20,001	8	3

The information comprised in the above table was procured from official sources, which exhibits a falling off since 1834 of Rs. 1,645, to be accounted for in this manner:—The British Government from 1834 opened other bunders, viz. Dollera, Bowlearee, Amlee, and Khoon Bunder, and removed the transit duties on this line of road, which induced the merchants to remove the trade to the new ports. These ports have been this year pronounced free by the British Government, consequently the falling off of the Cambay trade will be still more considerable every succeeding year. The amount of revenue exhibited above is what has been collected by the Bombay Government authorities. The Nawab's revenue from the same source more than doubles it.

Sources of Revenue, including all Taxes and Duties, derived by the Nawab, on Estimate for One Year.

Nawab's Revenue.	Annual Estimate.		
	<i>Rs.</i>	<i>a.</i>	<i>p.</i>
Town Duties, Sea and Land Customs	60,000	0	0
Revenue from Spirit Contract	2,000	0	0
Ditto from Opium Contract	1,000	0	0
Tax upon Houses, Fines levied, and other minor Taxes	5,000	0	0
Revenue derived from Salt Duty	15,000	0	0
Total Town Duties	83,000	0	0
Revenue of Land Produce of Purguuna	*275,000	0	0
Total amount of the Nawab's Revenue..	358,000	0	0
* From this amount of Land Revenue the Nawab pays annually to the British Government.. .. .	21,000	0	0

Mode of Collection.—The collection of the town duties is made by means of Karkoons and Peons, belonging to the Nawab and British Government, who are stationed at the Custom House, and other gates, ten in number.

The purgunna tax, or amount of assessment on the land, is collected by His Highness' servants. Some years the Nawab, when in want of money, farms out the whole land produce for the year, the contractor paying the amount to the Nawab, and making the collection himself.

Number of Sebundies, &c. engaged in above.—There are altogether 450 men for duty at the town gates: a certain number is allotted to each gate, under a Jemedar; a portion of these are on duty daily, and relieve each other according to their own lax system; there are sometimes not more than 50 on duty at all the gates. 150 men and 100 horsemen are distributed throughout the purgunna as guards: they are intended for this purpose, but are seldom to be found. Besides the above, there are 250 men and 200 horsemen receiving pay as the Nawab's body guard: a small number of these are in daily attendance about his palace. A large number of men are also retained as nominal servants, on salaries varying from Rs. 2 to Rs. 3 per mensem, who swell out the procession on State occasions.

Earthquakes.—In Guzerat these subterraneous convulsions are not of common occurrence. I have no recollection of any being recorded since June 1819, when its effects were fearfully experienced in Cutch and Guzerat. A few slight shocks have occurred since, at distant intervals, but too gentle to excite general remark. On the night of the 26th of last May we experienced another earthquake, of which Mount Aboo, near Deesa, appears to have been the focus: the shocks were felt in all directions—at Agra, Cambay, and Hoshungabad in the province of Kandeish. The shocks at every station on the line of the above stations were only felt on the night of the 26th, doing no damage anywhere save at the Mount, where the shocks and tremblings were experienced with more or less severity daily for upwards of a month—a phenomenon unprecedented in Indian history.

I will here note from the register the state of the weather for the three preceding days:—24th.—Morning close and clear; day hot and dusty; evening windy; dark masses of clouds gathering at night in the west. 25th.—Morning clear; day hot, windy, with dust; dark clouds with lightning in the west after sunset. 26th.—Morning clear and close; hot and close day; thermometer in the house at 3 P. M. 93°. About 25 minutes past 6 P. M. a dense dark mass was observed along the southern quarter, obscuring the horizon, which approached rapidly, and proved to be a dust-storm, which swept over Cambay in one continuous gust for half an hour, cooling the atmosphere while it lasted, followed by sultriness and a louring sky, with lightning in the south and west. The first shock was felt at 20 minutes past 10 P. M., a rocking motion; and the second about 35 minutes past 12 o'clock; this latter was a tremulous motion, and lasted about 10 seconds. A little breeze sprung up

between the shocks. This article has already extended to too great a length to admit of further remark.

Public Buildings. Jumma Musjid.—This Mahomedan mosque, which is of a large size, is of a quadrangular figure, with numerous domes and pillars, forming four sides of a square, and area in the centre. The whole is constructed of sandstone. The domes and pillars have varied ornamental decorations, and the floor is paved with marble at the principal part, where the priest recites the prayers. There is an Arabic inscription at the entrance, in the centre of the north square, a copy of which I have had taken, and forward with this report.

It was erected in the reign of Sultan Mahomed Shah, by a Mahomedan of rank of the name of Shere Mahomed Nowbaharee, completed on the 18th day of the month Mohurum, in the year of the Hijree 725, corresponding with the year of our Lord 1308, so that 540 years have elapsed since this edifice was completed. There was a very lofty dome on the south square, covering the largest space of any, and facing the entrance, under which the remains of the founder are entombed. This dome was thrown down by a severe shock of an earthquake in June 1819, the same which caused the devastations in Cutch, and throughout Guzerat.

Arabic Inscription on the Tablet in the Jumma Musjid, at Cambay, translated into English.

In the Name of the Most Merciful God !

All the Mosques are dedicated to God !

When you pray, call upon the Name of God only !

It is said by the Prophet Mahomed, (with whom be peace !) that “ whosoever builds a Mosque for the service of God, though in comparison with the nest of a bat, God will build up for him a house in heaven.”

This Temple is dedicated to God, and devoted to His service.

This great holy Mosque, erected out of my own legal property, acquired by honest means, through the blessing of the Almighty, and dedicated to His service in the reign of the just and powerful Sultan Mahomed Shah, son of Toogluck Shah, whom may God save, and render his reign prosperous !

I am a humble creature, Shere Mahomed Nowbaharee, depending on the hope of the Almighty : may He grant my wishes !

Completed on the 18th day of the month Mohurum, in the year of the Hijree 725. (Corresponding with the year of our Lord 1308.)

AUGUSTUS SUMMERS.

On the 5th July 1848 the mosque had been erected 540 years.

In June 1819, the largest and loftiest dome, under which the remains of the founder are entombed, was thrown down by a severe shock of an earthquake, the same which caused the devastations in Cutch, and throughout Guzerat.

مما انته الله من فضله وكرمه خالصا لله
تعالى في عهد السلطان العالم العادل
محمد شاه بن تغلق شاه السلطان خلد الله ملكه
وسلطانه العبد الضعيف الراجح الى
رحمة الله تعالى ايقال بشير محمد النوبهاري
حصل الله من امر و كلف ذلك في الثامن عشر
من المحرم سنة خمس وعشرين و سبعمائة
تاريخ مسجد جامع كهنبايت من مضافات احمد آباد گجرات بقلم مير حسن

(True Copy)

A Summers.

*Copy of the Arabic Inscription on the Tablet at the
Jumma Masjid of Cambay, in the Province of Guzerat*

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

وَإِنَّ الْمَسْجِدَ لِلَّهِ فَلَا تَدْعُوا مَعَ اللَّهِ تُعْلَى

الْهَآ وَاحِدًا وَقَالَ عَلَيْهِ السَّلَامُ مَنْ بَنَى

مَسْجِدَ اللَّهِ وَلَوْ كَفَتْهُ قِطَاعُ بَنِي اللَّهِ تَعْلَى

لَهُ بَيْتٌ فِي الْجَنَّةِ هَذَا مِمَّا وَقَفَ اللَّهُ تَعْلَى

وَبُنِيَ عَلَيْهِ هَذَا الْمَسْجِدُ الْجَامِعُ الْمُبَارَكُ

وَعِمَارَتُهُ مِنْ جَمِيعِهِ وَكُلُّهُ مِنْ خَالِصِ مَالِ

مَمَّا

Jain Temple.—This ancient Shavuk or Jain temple, dedicated to their divinity Parasnath, embraces two distinct periods in its history. The oldest appear to be the upper apartments, in the inner of which there is an old inscription affixed to the wall, bearing date Vikramajit Sumvut or year 1165. In this apartment there is a sculptured male figure of white marble, on which is inscribed the name Goutama Sammi, and date 1041 of the same era—even older than the inscription on the tablet. The present year being 1904-05 makes it 863 years old. The figure, which is quite different to the others, I will attempt to describe.

It is one foot in height, in a sitting posture : the right hand, holding a string of beads, is crossed to the epigastrium ; the left arm is a little curved at the elbow, the open hand resting on the left knee, which is turned inwards, the foot reaching opposite the pelvis ; the right leg from the knee is bent downwards, and resting on the pedestal.

There are two female figures, one named Padma Vuttee, about 18 inches in height, the other Dhurnee Dhur. Both bear date 1702. The other figures are sculptured representations of their divinity Parasnath, in a sitting posture, with the legs crossed in front, and the open palms, one above the other, resting on them. The principal statue here is one of white marble, about 4 feet in height, and bears date 1644 ; the figure resting on an ornamented pedestal of marble, the sides and above the head decorated as elsewhere described. The measurement from the bottom of the pedestal to the top of the ornamental devices is 9 feet. There is a black marble statue, bearing date 1706, about 4 feet in height ; also a solid one of crystal, a foot in height, and numerous others representing the same divinity.

Over the entrance to the subterranean temple (which is descended into by a flight of twenty-four steps) is a black marble tablet, engraved by Shevra Heervejahur, giving the date of the commencement in the era of Rajah Vikramajit of Ougein, Sumvut or year 1582, and Sumvut 1644 as dating its completion, embracing a period of 62 years in the construction of the subterranean temple, preparation of the sculptured statues and ornamental devices, and placing them in their position ; and a lapse of 323 years from the time of its commencement to the present year 1904-05, corresponding to the year of our Lord 1848. The principal statue of Parasnath here is of one solid piece of white marble, bearing date 1658. The proportions are considerably larger than the human, in a sitting posture, 7 feet in height, measuring 3 feet across from shoulder to shoulder, and 5 feet from knee to knee, which are bent inwards, and cross in front of the pelvis. Over the head is a tiara or canopy of marble, representing numerous cobra heads. The pedestal of solid marble, on which the statue rests, is about 3 feet in height, decorated with varied sculptured devices of animals, birds, &c. The sides of the ornamental structure, reaching a few feet above the head, are decorated with rich, varied, and continuous devices, representing figures of men, animals, musicians with their different

instruments, trees, &c. all tastefully executed. The workmanship of the principal figure is 12 feet from the base of the pedestal to the top of the ornamental decorations. There are several smaller statues, ornamented in a similar manner : one of these bears date 1616. The subterranean apartment has one aperture near the staircase, to admit light and air, but the place is very damp and dark, and requires torches to enable you to view the sculptures.

Parsee Temple.—The Parsees have a large fire temple in the town, erected about five years ago at considerable expense by Pestonjee Cursetjee Mody, of Ralcij, also a cemetery for their dead about two miles outside the town, in an easterly direction.

Conclusion.—In drawing this statistical report to a close, it only remains that I should offer a few remarks as to its accuracy, and the sources whence the materials were obtained. With many of the subjects embraced in this report I was conversant in some measure, as a residence of thirteen years in an official capacity gave me opportunities of gaining information, derived from personal inquiries among the old residents, and my own observation; numerous other subjects were quite new to me. But when I undertook its compilation, every subject had a proper share of investigation afresh, the rough draught comprising the materials I obtained from official sources where they were procurable, or from the most credible and authentic channels connected with each distinct branch treated upon.

To ensure accuracy, the greater part of my time for some months past, late and early, was devoted to collecting, comparing, and arranging the materials, so as to form an accurate and trustworthy report, with the view of meeting the wishes of Government.

It is doubtless imbued with some imperfections, towards which I would solicit the Government's clemency, and with this hope I beg leave to submit it for the favourable consideration of the Bombay Government and the Honorable the Court of Directors.

AUGUSTUS SUMMERS,

Second Senior Apothecary, in Medical Charge, Cambay.

Cambay, 23rd August 1848.

STATEMENT OF THE WROUGHT AGATES, CORNELIANS, &c. ;
TOGETHER WITH THE VARIED PROCESSES OF PREPARATION, AND VALUE OF THE TRADE AT CAMBAY.

TO A. J. MONTEFIORE, Esq.,

Superintending Surgeon Northern Division of Guzerat.

SIR,

In responding to the call made by the Guzerat Committee convened at Ahmedabad in connection with the approaching grand Industrial Exhibition in London in 1851, I have taken some pains in drawing up a Report upon the Cornelian Trade, embodying all the information I could elicit having reference to the wrought agates, cornelians, &c., together with the varied processes of preparation, and value of the trade at Cambay.

I have handed up one statement to the Secretary of the Committee, and respectfully beg leave to forward you a copy of the Report for presentation to Government through the Medical Board, in the hope that it will prove satisfactory, and merit their approbation; and should it be deemed worthy, a copy may be submitted to the Honorable the Court of Directors.

I have the honour to be, Sir,

Your most obedient Servant,

AUGUSTUS SUMMERS,

Senior Apothecary, in Medical Charge, Cambay.

Cambay, 6th July 1850.

The agate and cornelian trade forms a subject of much interest; but its *modus operandi* has hitherto excited little attention, or desire manifested to acquire a knowledge of its varied and complex process, from first procuring the stones in the rough state, to the ultimate perfection of finish arrived at by the art of the lapidary at Cambay. This I have now attempted to describe in detail, and from the following statement of the different agates and cornelians it will be evident, that though they still bear the name of Cambay stones, and this place has held the reputation for a considerable time of being famed for its stone quarries, they are actually brought here in the rough state from different parts of Guzerat, and are only wrought in the lapidary workshops established here upwards of a century; and although the value of the traffic has been considerably reduced of late years, it still forms, next to cloth, the principal article of commerce, yielding a good profit to the traders, forming

a valuable source of revenue to the State, and giving employment to near 2,000 people engaged in the manipulation of the articles in the busy workshops, amounting in all to about 75 large and 25 small shops.

The traders consist of about 14 Banyan and Borah merchants, who purchase the wrought articles from the heads of the lapidary workshops, and send them to Bombay, Jedda, and other ports.

The workmen or artificers form a distinct corporate body, called Ukkeekia Jumat or Punchayut, and are designated as follows:—

100 Ukkeekias, or master artificers and heads of establishments.

300 Gasseas, or workers on the lapidary wheels.

200 Dholias, or polishers on the rough and hard polishing stone.

50 Puttymars, or polishers on the wooden frame.

100 Badars or Borers, or those employed in the drilling process.

750 in number. These form the punchayut or regularly constituted trades-craft; besides which upwards of a thousand people are employed in the different shops as day-labourers in the clipping process, cutting slabs, &c.; they consist of men and boys of both the Hindoo and Mahomedan faith.

The punchayut hold the power of adding to their community, the party so privileged paying a few hundred rupees for his admission into the craft, which is spent in dinners. Each department of labour remains distinct; the artisan in one branch will not interfere with, or undertake the work of another branch, and each enjoys distinct privileges, appertaining to his particular department, needless to note here.

List of the various Agates, Cornelians, &c. worked upon by the Lapidaries at Cambay, and where procured.

Description of Stone.	Where procured.	Quarried, or how procured, Size, and Formation.	Remarks.
<i>Jasper, Heliotrope, or Bloodstone.</i> —A beautifully variegated stone of greenish basis. The green, with flamed streaks or red spotted delineations, is named by the lapidary <i>Lectia Chantalar</i> ; those more variegated with green, red, and yellow tints are named <i>Puttolia</i> . It occurs in massive layers, is hard, with a dull fracture, and takes a high polish.	Near the village of Tunkarra, in the territory of the Moorvi Rajah, about 12 miles north of Raycote.	Found on the hill named Bung, and below the hill under the soil, in massive layers from 2 to 40 lbs. in weight.	For permission to collect the stone, 8 annas per maund (40 lbs.) is paid to the Rajah, and 2 annas for each bullock load for passing through his territory, and Rs. 4 $\frac{1}{2}$ bullock hire to Cambay. A bullock load contains 3 maunds, on which a town duty of 8 annas is levied at Cambay.
<i>Moss Agate, Calcedony.</i> —Named by the lapidary Sowa Bajee. This is a beautiful species of agate, of a very clear or clouded crystalline basis, with impressions of the dark green moss, or green and reddish brown moss delineations. Found in massive layers, often cracked in various ways. It is hard, and receives a fine polish.	Near the village of Tunkarra, in the territory of the Moorvi Rajah, and at Dood Kotra, about 3 miles from Tunkarra.	It occurs in the plain, about 2 feet under the surface of the soil, in massive layers, cracked, and weighing from $\frac{3}{4}$ to 30 or 40 lbs.	Ditto ditto ditto.
<i>Agate, common.</i> —A mineral whose basis is calcedony, blended with quartz and cornelian. The white or semi-transparent is named <i>Dolah</i> , and the cloudy and streaked <i>Jamma</i> . It is generally greyish white, of different shades. It is pretty hard, brittle, and massive, and receives a high polish.	Near the village of Mahipore, 3 miles from Tunkarra, in the territory of the Moorvi Rajah.	It occurs in the plain near the surface of the soil, in massive blocks, the most perfect not exceeding 5 lbs., the inferior quality, and cracked, as high as 60 lbs. in weight.	Ditto ditto ditto.
<i>Agate, Kupperwunge.</i> —This is a beautiful species of agate, some having the impressions of mineralized plants delicately preserved, with a clear or semi-transparent basis, and is named <i>Karriah</i> ; others of variegated shades of colour, with landscape or other delineations, are named <i>Aggeeah</i> , <i>Rutteea</i> , &c. It occurs in pebbles or rolled masses, is hard, and receives a high degree of polish.	At Kupperwunge, in the Kaira zillah, and in the bed of the river Majam, between the village of Amliala and Mandwah, about 15 miles from Kupperwunge.	It occurs on the banks, and in the beds of rivers in rolled balls of spheroidal, reniform, and amygdaloidal figures, from 1 to 10 lbs. in weight.	The Bheds search for the stones, and sell them to a Borth at Mandwah, from whom the lapidaries purchase them at from Rs. 3 to Rs. 12 per maund, according to quality. They are carted or brought on donkeys to Cambay. 10 maunds of the stone are valued at Rs. 100, on which a town duty of Rs. 4-8-0 is charged here.

<i>Agate, Veined</i> .—Named by the lapidary Doradar, of Rhanpore, and adjacent villages, named the upper strata of the dark ground with white thread streaks, or a different shades of white, with dark streaks, or a different forms. It occurs imbedded in clayey soil, is hard, and takes a very high polish.	At Rhanpore, and adjacent villages, named Darpilee & Ninana, in the Ahmedabad zillah, near Dundooka.	Found imbedded under the upper strata of soil, in pebbles of various shapes, not exceeding $\frac{1}{2}$ lb. in weight.	A fee of Rs. 2 per cart load is paid to the Government authorities, and the stones are carted to Cambay. The cart load is 40 maunds, which pays a town duty of Rs. 2 here.
<i>Chocolate Stone</i> .—Assuming its colour as the name implies, and is called 'Kachh'; of a brownish earthy basis, not very hard, of a dull fracture, and does not take a high polish.	At Rhanpore, near Dundooka, and at Tunkarra, in the territory of the Moori Rajah.	It occurs on the surface, and imbedded a few feet under the soil, in masses from 1 to 8 lbs. in weight.	Brought from Tunkarra on bullocks, at the rate of Rs. $4\frac{1}{2}$ per load, and in carts from Rhanpore, Rs. 15 hire per cart load, besides the Government fee of Rs. 2 per cart load here.
<i>Crystal</i> .—Named here Phuttue; a clear transparent stone, resembling glass in appearance, and receives a high polish.	At Tunkarra, in the territory of the Rajah of Moori.	Occurs in masses under the surface of the soil, from 1 to 20 lbs. in weight.	Pays the same duty as the other stones procured in the Rajah of Moori's territory.
<i>Variegated Stone</i> .—Named by the lapidary Minarian; of a liver brown, earthy basis, with yellowish impressions of shells and animalcules, having a marbled appearance, but does not receive a good polish.	At Dhokavarra, in the Rann, about 60 miles north of Deesa.	Found in large masses on the hill, and dug up in large blocks at its base.	Carted to Cambay.
<i>Lapis Lazuli, or the Azure Stone</i> .—Named here Rajah Wurud; of a deep blue colour, and earthy basis, with sprinkling of silvery or golden spots; may be known by its beautiful mingled blue colour. It is soft, and does not receive a high polish.	Imported to Cambay from Baghav. Brought from Persia and Bucharia.	Said to be found in rounded balls in the bed of rivers.	
<i>Jet Stone, Obsidian</i> .—Named here Kalla Puttur resembling glass in fracture, not very heavy, and takes a high polish.	Imported here from Bombay.	Occurs on the hills at Russorah, and at Aden, in large blocks.	
<i>Blue Stone, Perosa</i> .—Assuming various shades of blue. This is a composition resembling glass, soft, and takes a good polish, resembling the true Perosa when highly polished.	Imported here from Bombay. Is said to be prepared at China.	Brought from China in flat pieces, not exceeding $\frac{1}{2}$ lb. in weight.	

Description of Stone.	Where procured.	Quarried, or how procured, Size, and Formation.	Remarks.
<p><i>Cornelian, Ukkeek.</i>—Named Ghar in the original state. They are cloudy, of various shades of brown, and others of different tints of yellow, in the natural state. After exposure to the sun, and baking, these assume other tints as follows:—light brown becomes white, Dhola; pale yellow, rose coloured or Gulabi; deep yellow, red or Lal; a mixture of cloudy brown and yellow becomes white and red, named Ubluekee; another shade of yellow turns pinkish purple, named Nafarmani, and brown becomes a darker shade, named Emni.</p>	<p>At the base of the hills of Bowa Goree, Bowa Abbas, and Raj-peetlee, in the territory of the Nandode Rajah, who is tributary to His Highness the Guicowar. The Nandode Rajah farms the quarries to Native contractors, who pay annually from Rs. 2,000 to Rs. 2,500 to the Rajah for the sole privilege of collecting the stones.</p>	<p>Quarried or dug up from near the base of the hills in various shapes. The pebbles are imbedded in a soft yellow soil, or in bluish grey clay, of size varying from a small pebble to a pound in weight, and are chiefly of uneven form and surface.</p>	<p>Between the Bowa Goree and Bowa Abbas hills, on the plain, are small mounds, from whence the stones are quarried by the Bheels of the district: they excavate to some depth, forming galleries in a horizontal direction about 5 feet in height and 4 feet broad. They are obliged to use a lamp, and work in pairs, one employed with a pick-axe in the quarry, the other at the entrance, who examines the stones by chipping off a piece, retaining the good and rejecting the bad on the spot.</p>
<p>The above are quarried in large quantities, and undergo the process of baking. They receive a high degree of polish, and are wrought into flat and round necklaces, bracelets, armlets, chessmen, stones for seals, studs, rings, marbles, &c.</p>			<p>When a larger number of men are employed, the galleries are extended in different directions, leaving supports and air passages. The labour of the two men for eight or ten hours produces from 10 to 40 lbs. in weight, which is brought in the evening to the village of Ruttunpore, and transferred to the contractor or his people. When a large quantity is thus procured, they are exposed to the sun in the fields for two months or more, after which, in the month of May generally, a trench is formed round a field 2 feet in depth and 3 feet in breadth. In this fires of goats' and cow-dung are lit up, and the stones in earthen pots in single rows are placed in the trench. The fire is kept up from sunset to sunrise, when the clatties are removed, and the stones piled away.</p>
			<p>The contractor attends to the heating process. The stones are once a year carted to Nemodra, and conveyed in canoes down the river to Broach, whence they are brought in boats to Cambay. Each bag of 25 maunds pays a duty of Rs. 1½ to the Bombay Government at Broach, in addition to the import and export duty at</p>

Cambay. The stones are sold to the heads of the lapidary manufactories. The town import duty is Rs. 1-8-0.

The other stones found in the neighbourhood, or on the hills, and not subjected to the heating process, are as follows:—

Mora or Bowa Goree.—A species of onyx or dark coloured cornelian, with white veins, or a greyish white ground with dark veins, assuming various figures; receives a high degree of polish, and is much prized in the Jedda market.

The true onyx, or Sulamani, is brought here by Mahomedan mendicants, in ready made strings of beads.

Cat's Eye, named *Cheshumdar*.—The principal colour is grey, presenting many varieties, usually translucent. It is hard, and bears the impression of a cat's or bird's eye more or less perfect. It is much esteemed, and receives a high polish.

Roree or *Lassunia*.—A yellow pebble, semi-transparent, found scantly with the cat's eye; receives a very fine polish, and is much esteemed. Usually cut for ring stones.

On the Bowa Goree and Mora is found on and at the base of the hills, in pebbles not exceeding 1 lb. in weight.

at their base, and in the bed of the river formed by the monsoon streams between the hills.

Found on the Bowa Goree and Bowa Abbas hills, or at their base, and in the bed of the river formed by the rains between the hills, which is dry in the Month of October.

The pebbles are searched for by the Bheels of the district, and disposed of to the contractor at Rutnumpore, who sells them to the heads of the different lapidary manufactories at Cambay.

Ditto ditto. ditto.

Articles wrought by the Lapidaries at Cambay.

Wrought for sale to the general try passing through Cambay, & sent to Bombay for the English, Calcutta, and other markets.

The whole of the agates, bloodstones, and cornelians are made use of and worked into models of cannon, with carriage and appurtenance complete; slabs for boxes; sets of variety of slabs, twenty in number, to form a square table; cups and saucers; chess-men; flower vases; pen-rack; card and letter-racks; watch-stands, ink-stands; knife-handles; rulers; paper-cutters; pen-holders; sets of necklaces; bracelets; brooches of a variety of patterns; paper-weights; crotchet needles; silk-winders; marbles; brace and shirt studs; seals; also rough specimens of stone having one side polished.

Wrought articles for the China mart.

Articles wrought for China comprise only two kinds, and are made up entirely of cornelian. First, the oval and square flat stones, resembling watch seals, large and small, named mogly ghool, worn as armlets and dress ornaments. The other variety is the bead named here dholl, each necklace containing fifty beads. These are all plain, polished, and round. Vast quantities of the above are exported from this in chests to Bombay for China: the extent of valuation is from Rs. 50,000 to Rs. 60,000 annually.

Articles for the Mocha, Jeddah, and Mecca markets.

The descriptions of stones employed are the veined agate from Ranpore, cornelians from Ruttumpore, the cat's eye, and the jet or obsidian. These are wrought into large quantities of rings, both plain and ornamented, ring stones, necklaces, wristlets, and armlets, embracing the following variety:—

Necklaces.—1, peylodard dholl, cut beads; 2, goocrudar dholl, diamond cut beads; 3, badamee arr, almond-shaped necklace; 4, khantlee, oblong flat necklace; 5, chamulee, spear-head shaped; 6, madalyah, tawitch, or tahwiz, composed of three stones; and 7, sadah khauta, plain round beads, used as a necklace and rosary.

Armlets and Wristlets.—Mootea madalyah, composed of two stones, worn as either; pytah, a wristlet composed of seven round flat stones; poonchee, a wristlet composed of several flat stones; byjootah, an armlet of one stone cut in different fanciful devices; neemghool, single stones in the shape of large flat seals.

Rings.—Rings are made of cornelian of various devices, named ungotee, and ring stones for setting, called nuggeena, are made of cornelian and the cat's eye.

The articles for the Jeddah and Mocha marts are packed up in chests, also in bales with the cloths, and exported to Bombay and Veraiwul Bunder, whence they are transhipped to their destination, and from thence they find their way into Arabia, Persia, Scinde, and Afghanistan, the merchants realizing a vast profit by the sales effected.

Mode of Manipulation, or Process by which the different Articles are wrought.

Beads.—The following is the process of making beads :—The stones are first broken into pieces of the size desired. An iron spike named khondia is driven into the ground in an inclined direction, with one point upwards. The stone is placed on this point, and chipped with a hammer made of horn, till nearly rounded. It is then passed on to the polisher, who fixes a number, of equal size, in a pair of wooden or bamboo clams, and rubs them on a coarse and hard polishing stone called dholia. These are then transferred to another man, who, securing them in a grooved clam, rubs them against a grooved polishing board, named puttymar, on which is smeared a composition of emery and seed lac, turning the beads round, so that every part of the surface may assume a globular form, and become polished. The final polish is given by the beads so prepared being put from one to several thousands into a stout leather bag about 2 feet in length and from 10 to 12 inches in diameter, with some emery dust, and a very fine powder named wurry (which is the sediment of the cornelian deposited in the earthen dish, partially filled with water during the process of drilling holes in the beads, which is always collected and dried); the mouth of the bag is tied up, a flat leather thong or tape is passed round its centre, and the bag is rolled towards each other by two men seated at opposite ends of a room, from ten to fifteen days. The leather bag is kept moistened with water. When the beads have taken a bright polish, they are passed on to the people who bore the holes, which is effected by means of a steel drill tipped with a small diamond, during which process the spot is fed with water drop by drop, passed through a thin narrow reed or metallic tube.

The Cut Bead is passed from the rough polishing stone to the lapidary polishing and cutting plate, and lastly the holes are drilled.

Knife-handles.—These undergo exactly the same process as the cut beads, adapting the shape to any pattern.

Cups and Saucers, and other hollow articles, are wrought, according to the required external shape, on the steel spike, and a rough polish given on the hard polishing stone; the cavity is formed by the diamond tipped drill to the depth of one-fourth of an inch all over the space until it exhibits a honey-combed surface; the prominent places round the holes are then chipped away, and this process is repeated until the depth and form desired is obtained. They are then polished upon prepared moulds of convex formation, and of the same composition as the polishing plates, which are attached to the turning wheel.

Cannon.—The bore of the cannon is effected by a drill with two diamonds to the depth required; afterwards five others in succession of proportionate increase in thickness are substituted, each having an increase in number of diamonds, placed circlewise, the last encircling as many as twelve diamonds.

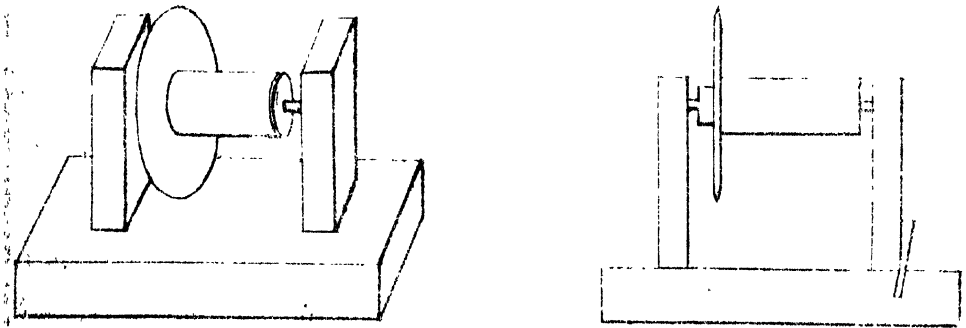
Slabs, Paper-cutters, Paper-weights, &c. are cut by means of a toothless saw made of iron, fixed to a light wooden frame, and the cut is fed with emery

dust and water. When the stone is small, the saw is worked by one man, when it is large by two men. The stone to be operated upon is attached to a large wooden frame, which is itself a fixture partly in the ground.

The Cement consists of a coarse description of bees'-wax, with the fine fibres of new cloth, by means of which the stones are firmly attached to the wooden frame-work. Several men in a row are at the same time employed in cutting through different pieces of stone.

Preparation of Polishing Plates.—The plates or discs are made of emery, (named korunge and sumadah,) a species of corundum, of greyish black colour, glistening lustre, and granular concretion. Its fine powder is obtained by trituration and levigation. This mixed with the seed lac forms the circular polishing plates, two in number. The first or coarse-grained is made in the proportion of three parts of ground emery to one of lac; the second or finer is made of $2\frac{1}{2}$ lbs. of finely levigated emery to one of lac. A third and finest polishing disc is composed of wurry and lac in equal proportions. Wurry is the sedimentary deposit of cornehan in an earthen dish during the polishing and drilling process. A copper disc is occasionally used for very hard stone, such as the Ceylon and other precious stones; and a wooden disc made of deal or other fine-grained wood is employed for polishing the softer descriptions of stone.

The following drawings and description of the lapidary wheel I have copied from the *Bombay Times* paper—they are very correct:—



Native Lapidary Wheel.—The wheel consists of a strong wooden platform, sixteen inches by six, and three inches thick. In this are two strong wooden uprights. Between these is a wooden roller eight inches long and three in diameter, fastened into a head at the one end. This works on an iron spindle or axle at each end. On the one end the axle is screwed and fitted with a nut, by which the cutting or grinding wheel can be made fast. The lap-wheels consist of two circular discs or cakes of lac with ground korund, coarse or fine according to the work; of a copper disc for polishing the very hard, and a wooden one for finishing the work of the softer description of stone. These are spun backwards and forwards by a bow, the string of which passes

round the roller. The lapidary sits on his hams, steadying the wheel with his foot, and holding on the stone with his left hand, while he works the bow with his right.

List of Agate and Cornelian Articles, with their Prices.

Description of Articles.	Price per Pair, Each, or Dozen.	Amount.	
		From	To
		<i>Rs.</i>	<i>Rs.</i>
A cannon, with carriage, limber carriage, and appurtenance complete	Each	200	250
A cannon, with carriage, of moss or other agate or blood-stone	"	70	100
A set of chess-men of any two varieties of stone	Per set	75	100
A set of variegated slabs, 20 pieces, to form a small square table	"	35	45
An oval slab and pedestal, forming a small miniature table...	Each	25	35
A large cup and saucer of agate or bloodstone	"	40	50
A cup and saucer, smaller size, of ditto	"	10	20
Slabs, large, six pieces of different or one description of stone, to form into a box—top, bottom, and sides	Per set	35	50
Slabs, a pair, to form the top and bottom of a box, good size	Per pair	8	15
Slabs, a pair, of smaller size, for snuff or other box	"	3	6
A pen-rack, with ink-stand, and a pen-holder	Per set	20	25
A watch-stand	Each	8	10
A letter or card-rack	"	10	12
A flower-stand or vase	"	20	30
Knife-handles of good description	Per doz.	12	18
Butter knife-handles of good pattern	Per pair	3	4
Rulers of agate or bloodstone	Each	3	5
Paper-cutters of ditto, of sizes	"	1	3
Paper-weights, of different sizes and patterns	"	3	6
Rough specimens of stone, one side polished	Per doz.	3	4
Stones for brooches, of different patterns	Each	1	4
Bracelets of variety of patterns	Per pair	4	8
Necklaces of ditto ditto	Per set	4	10
Crochet needles, pen-holders, and seals	Per pair	1	3
Brace studs, and coat button studs	Per doz.	3	4
Shirt studs	"	1	1
Marbles of different sizes	"	1	2
Cornelian stamps for engraving initials or crests	Per pair	3	6
Ear-drops, and tops to match	"	1	3

Table prepared from the Cambay Custom House Returns, exhibiting the Value of the Traffic in Wrought Cambay Stones, and Export Duty thereon, for two Official Years, 1848-49 and 1849-50, commencing in May and ending in April. "

Years.	Small Package.	Large Package.	Bamboo Basket.	Large Box.	Bags of Cornelians sent in large Bales of Cloth.		Total Value of Cornelians, &c. sent each year.		Customs Duty on part of the British Government.	
	Beendry.	Keesah.	Kundia.	Patie.	Bales.	Bags.	Rs.	a. p.	Rs.	a. p.
1848-49....	10	3	13	23	49	312	1,08,422	0 0	1,350	4 0
1849-50....	18	1	11	6	98	536	94,902	0 0	1,186	4 6

In the above table the export duty levied by the Nawab is not given. The amount exactly trebles that of the British Government, which is calculated at Rs. 1-4-0 per cent. on valuation. This is independent of private fees levied by the Nawab's Native officials.

The bags of cornelians noticed above are packed up in large bales with cloth, and sent to Veraiwal Bunder, a port west of Diu, on the Kattyawar coast, whence they are re-shipped to Jedda.

With this statement I will close my labours, undertaken for presentation to the Committee convened for Guzerat, in connection with the grand Exhibition of Arts and Industry in England in 1851, to whose call I have responded in drawing up this statement, in the hope that it may prove satisfactory, and merit the approbation of Government.

AUGUSTUS SUMMERS,
Senior Apothecary, in Medical Charge, Cambay.

Cambay, 14th June 1850.

SELECTIONS FROM THE RECORDS OF THE BOMBAY
GOVERNMENT.

NO. V.—NEW SERIES

REPORT ON THE COLLECTORATE OF
AHMEDABAD.

BY

E. G. FAWCETT, ESQ.

—

A SHORT ACCOUNT OF THE CHOOTAS:

A TRIBE INHABITING PORTIONS OF THE VALLEY OF THE HUBB AND
OF THE COUNTRY ADJACENT TO THE WESTERN FRONTIER
OF SINDH

BY

LIEUTENANT C. J. STEUART,
DEPUTY COLLECTOR, KURACHIE

PUBLISHED BY AUTHORITY

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1851.

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REPORT ON THE COLLECTORATE OF
AHMEDABAD;

BY

E. G. FAWCETT, ESQ

REPORT ON THE AHMEDABAD COLLECTORATE.

AREA.

THE Ahmedabad Collectorate is divided into seven purgunnas, viz. Duskrohie Ahmedabad, Duskrohie Jetulpoor, Puranteje, Dholka, Veerumgaum, Dhundooka, and Gogo, whose area, according to estimated quantities from the records of this office, amounts to 4,794,376 beegas, equal to 2,817,631 acres. These purgunnas, with the exception of Dhundooka and Gogo, have undergone a revenue survey measurement, the khalsa or Government villages in detail, and the mehwassee and talookdaree villages as regards their boundaries.

The table below gives a general statistical view of the number of villages, the population, and area of the Collectorate :—

Names of the Mahals.	Khalsa.	Talooka.	Mehwassee.	Alienated Villages.				Total of Villages under each Mahal.	Population according to the 1st January 1848.			Area in Square Miles.
				Suriogama.	Dewastan.	Dhurmada.	Inanee and Jagheer.		Males.	Females.	Total.	
Duskrohie Ahmedabad ...	122	..	..	..	4	3	7	136	86,779	74,092	160,871	293.90
Duskrohie Jetulpoor.....	45	..	..	..	1	1	1	48	23,334	17,497	40,831	160.29
Dholka.....	90	83	..	2	2	2	2	181	62,265	47,948	110,205	913.56
Dhundooka ...	10	163	..	..	4	..	..	177	50,085	40,451	90,536	1,325.
Veerumgaum .	77	14	62	..	1	..	16	170	41,394	30,638	72,032	771.72
Puranteje.....	126	5	41	..	2	2	..	176	36,429	26,621	63,050	453.08
Gogo	4	124	..	..	1	..	10	139	32,968	27,393	60,361	485.
Grand Total...	474	389	103	2	15	8	36	1027	333,254	264,632	597,886	4,402.55

[NOTE.—The population of the city of Ahmedabad is included in the Ahmedabad Duskrohie. The population of the city is 45,723 males, and 45,501 females, total 91,224 ; and the area of the city and its suburbs is 2.24 miles.]

The seven purgunnas above named are each a Mamlutdar's charge. The purgunna of Ahmedabad Duskrohie formerly included Jetulpoor also, but the charge being found inconveniently large, it was divided in 1840 as it now stands. The city of Ahmedabad is situated near the centre of the purgunna of Ahmedabad Duskrohie, and has a separate police, under a Foujdar. The Dholka purgunna has one sub-division, the Sanund mahal, at the kusba of which name a Foujdar is stationed for the transaction of police of Dholka kusba.

The Veerungann purgunna contains the original sub-division of the Choowal, which is almost entirely mehwasee, and held by Kallee Thakores, who formerly were much dreaded in the country, from their plundering habits; they are now, however, very much improved in this respect. This sub-division is not a separate charge, but there is a Thanadar stationed at Mandul, for the transaction of revenue and police business in this vicinity. Mandul is not an original sub-division of the country, but adopted for convenience. The Jagheerdar of Patree has the police charge of the villages composing his jagheer.

The purgunna of Puranteje is divided into four sub-divisions—Puranteje, Hursole, Morassa, and Bayur, and these also are commonly called purgunnas from old custom. The Mamlutdar's station is the kusba of Puranteje, and the Hursole division is merged into the Puranteje division. Thanadars are stationed at Morassa and Bayur, which are each about 28 miles distant from Puranteje kusba, for the transaction of revenue and police business in the respective divisions. These two divisions are slowly recovering from a state of jungle, and there are many mehwasee villages about this part of the country which gave much trouble for several years after the purgunna first came under British rule, but of late years the people have much improved in their habits.

The Dhundooka purgunna contains the sub-division of the Ranpoor purgunna, which is a station of a Thanadar. The trading town of Dholera, situated near a creek leading into the Gulf of Cambay, is the seat of a Foujdar.

The Gogo purgunna contains Bhownuggur, the city of the Thakore of that title, the police of which is maintained by the Thakore, and a Foujdar resides there, under whom also are all the talookdaree villages of the Thakore which are situated within the purgunna.

[NOTE.—The land revenue in tolerably good seasons amounts to about Rs. 12,00,000, of which about Rs. 19½ per 100 may be deducted as charges of collection, leaving a net revenue of about Rs. 9,68,287.]

NATURAL ASPECT.

To begin with northern districts, and proceed southward. Morassa is situated nearly on the border of the Meywar province, the hilly tracts of which province terminate near Morassa; and the country then becomes undulating in the direction of

Personal observation.

Hursole, and also towards Bayur, getting less so as Morassa is left behind. In this latter purgunna the country is flat, interspersed with little rising ground ; and continues so on to the eastward of Bayur purgunna, in the vicinity of Talor and Odha, where the country becomes rocky.

The Puranteje district is flatter, but also undulating ; and the soil becomes more sandy, which is called goraroo, from its whitish appearance, 'gora' meaning white in Guzerattee. This continues to the banks of the Saburmuttee, which forms the western boundary of the purgunna. The banks of the river are studded with numerous deep ravines.

The Veerungaum purgunna is a flat open country, with low jungle, and very few large trees, excepting in the vicinity of villages. In the vicinity of Delraze, and Kookawas, a number of mango and raen trees give the country a more inviting appearance.

To the south of Veerungaum the country gets more flat and bare, up to the great lake commonly known as the Null.

The Dholka purgunna is also a level country, open about the north part, but tolerably well wooded near the kusba, and to the westward gets quite open and destitute of trees, except at the villages, which are distinguishable from a considerable distance by clusters of trees growing in them ; the rest of the face of the country is remarkably bare in appearance.

The Duskrohic purgunna is also a flat country, but more overspread with trees, particularly in the vicinity of Ahmedabad, near which, and on the eastern side, it presents a park-like appearance.

The Dhundooka purgunna is a flat level country, the sites of villages discernible at a great distance, as in the western part of Dholka. The Ranpoor purgunna, to the westward, where it abuts on the territories of the tributary chiefs under the Rajcote Political Agency, becomes rather hilly, but there are no high hills. Those to the west of Ranpoor, near the villages of Nolee, Nagurka, Loreah, Gungajul, and near Goreea and Dharpeepla, yield the moss stones and agates, which are cut into slabs for snuff-boxes and other trinkets by the lapidaries of Cambay.

The Gogo purgunna contains a range of high hills, probably 700 feet in height, running north and south. The surface is stony, and considerable quantities of grass are obtained from them, by which the neighbouring villages are supplied.

SOIL.

There are two principal varieties of soil in this Collectorate, the black soil, which is commonly found throughout India, and the goraroo, so called from the word 'gora' white : it is light-coloured, and, with the assistance of manure and irrigation, very fertile. In the dry weather, where subject to be much triturated, as in roads, it forms deep, heavy, and almost impalpable sand, which, again, after rain, becomes tolerably compact and hard.

The bed of the river Saburmuttee is very broad, and affords in many

situations a description of soil called *blata*, which is a deposit of the mud of the river. It is liable to much fluctuation of value from the different depths of loam or sand which the river may deposit. It is the most fertile soil in this part of the country, and as water is generally found at the depth of a few feet, it is easily irrigated. Near Morassa, a red stony soil is found, like that of Belgaum in the Deccan.

The accompanying sketch map attempts to give the general locality of the different descriptions of soil. The *goraroo* prevails to the eastward, and the black soil to the westward, although in many villages both soils are to be found.

ATMOSPHERE AND CLIMATE.

The range of thermometer taken for the last eleven years, obtained from the register kept by the Civil Surgeon of the Ahmedabad zillah, is entered below.

The thermometer is kept in a place not exposed to sun or wind, as is usually the case.

To the feelings, the variations of temperature at different seasons are very great, and the cold occasionally in the months of November to February, though the thermometer has, I believe, not been known to fall so low as freezing-point, feels more penetrating than a hard frost in England. This, however, is not continuous, but comes on casually, sometimes for three days or a week together, two or three times during the season, and sometimes the season passes without any severe cold. The range of the thermometer pretty fairly denotes the heat of the hot weather (March to April), in which there is little change. This time of the year is generally considered healthy. The rains are hot and close : with the exception of a few very rainy days the monsoon is, generally speaking, very light in Ahmedabad.

The register of the pluviometer is embodied with that of the thermometer. This register appears not to have been kept regularly till 1842.

PRODUCTIONS.

The principal productions of the different purgunnas are given below, placed as near as may be in the order of the quantity produced :—

Veerumgaum.—Wheat, cotton, bajree, joowar, and gram.

Duskrohie Ahmedabad.—Bajree, joowar, pulses, wheat, barley, and garden productions.

Duskrohie Jetulpoor.—Bajree, rice, joowar, and sugar-cane.

Dholka.—Wheat, cotton, bajree, joowar, sugar-cane, &c.

Dhundooka.—Wheat, cotton, joowar, bajree, and gram.

Gogo.—Bajree, cotton, tull, wheat, and gram.

CATTLE.

Guzerat is famous for its breed of cattle. Oxen are much in use for travelling carts : they are of great size and strength, and able to travel considerable distances ; for short distances they are able to keep up a very fair pace of about 6 miles an hour. A pair of good oxen will fetch from Rs. 150 to Rs. 200.

This Collectorate, however, is not the head quarters of the breeding country, which is Kattywar, and the country about Kurree and Puttun. There is also a very good breed of cows in the Dhundooka purgunna, which give a large supply of milk, though not so large in size as those above alluded to. Many of them are exported for the supply of Bombay.

Some horses of the Kattywar breed are also bred here, but in no great number. The price of a good serviceable horse of this description may be quoted at Rs. 300 ; larger sums are given for mares, from the profit expected from their foals.

Sheep and goats are not much bred in this Collectorate ; the supply is principally derived from Marwar. Some few are bred, but only for the sake of milk, by the Natives. The Banyans manage to collect nearly all the males, and send them to Ranchera, a village of the Kurree district, belonging to the Nuggur Shet, which he has set apart as a pinjrapole or asylum for animals. Little care is bestowed upon them, and disease thins their number very quickly.

MODES OF CULTIVATION.

The cultivating season is generally considered to begin immediately after the first fall of rain in the month of June or July. A month or two before this, however, manure is carted to the fields by those who have means of conveyance, &c. at their disposal, and then the manure is raked out from the cart in heaps, and left there exposed to the action of the sun ; and after a fall of rain the manure is spread over the ground and ploughed in.

The plough used in this country is of a single share, and of the most simple construction, which penetrates the ground to the depth of 4 or 5 inches : after two ploughings the ground is considered ready for the reception of seed, which is sown by a drill-plough which will be described.

In general, ploughing cannot be commenced till rain falls, owing to the

hardness which the soil acquires from the heat and dryness of the atmosphere. In the Gogo puigunna, however, owing, it is said, to stones being mixed in a considerable degree with the soil, it is more penetrable, and ploughing commences in, and most of the fields are ploughed up by the end of March. I am doubtful about the reason assigned, as I have seen many fields ploughed in this puigunna where I saw no stones.

The accompanying sketches show the various agricultural implements in use in this Collectorate. They do not differ much from those in use in other zillahs, but the delineation and description may have interest. The sketches were made from implements in the neighbourhood of Ahmedabad.

References to the Native Names of the different parts of the Plough

- A. Hull — The coulter
- B. Chowra
- C. Kose — An iron share
- D. Kuswila — A wooden wedge to hold fast the kose and chowra
- E. Churah
- F. Dandee or Cher — The shaft
- G. Nali — An iron nail which serves to bind the yoke to the shaft
- H. Nalle — A rope of about half an inch thick made of twisted kather, for tying the yoke to the shaft
- I. Somul — 100 paces on the yoke to which the neck straps are tied
- J. Jotun — Neck straps, made of cotton thread and sometimes of leather
- K. Joosri — The yoke
- L. Hathi — The handle

According to information given by Chhurn Dulla, Patel of Bherampore, of the Ahmedabad Duskrohe puigunna, a plough costs as follows —

	<i>Rs. a. p.</i>			
Josia, yoke	0	6	0	
Hull, coulter, or body of the plough	0	8	0	This is always made of iron wood, which is less affected by friction than other wood
Cher, shaft	0	8	0	
Kose, iron share	0	1	0	
Chowra	0	0	0	Several of this required during the ploughing
<hr/>				
Total..Rs.	2	6	0	

The iron point consists of a slightly curved bar, about three quarters of an inch in diameter, and two feet long. It is pointed at one end, and put through a hole in the hull, when it is secured by a wedge. The forefoot of the hull, called the chowra, is also a separate piece. It is made separate on account of its liability, from its position, to much rubbing, consequently the cultivator generally provides himself with several of these, to put on as occasion requires. The chowra usually lasts two days' ploughing, but this of course depends on the soil. The village carpenter undertakes to fashion chowras for the season on

receiving $1\frac{1}{2}$ maund of grain, the cultivator supplying the seed. The several pieces of the plough are put together, as noted by the dotted line in the sketch annexed. The village blacksmith points the share whenever required, and receives $1\frac{1}{2}$ maund of grain per annum.

The sowing machine is simple and effective. There is a bowl at the top, into which the grain is placed, from which four hollow bamboos conduct the grain, each through one of the prongs of the harrow or rake. One person drives, and one person attends with a bag of grain tied round his waist, and feeds the machine. The prongs of the fork are about a foot apart, and the outlet for the grain is in the back part of the prong, so that it is not liable to get blocked up by earth in its progress. The yoke is made rather wider than usual, so that the oxen are kept clear of the furrows.

References to the Native Names of the different parts of the Sowing Machine.

- A Orence.—The wooden bowl.
- B Dandwa. The four hollow bamboos.
- C Loreca.—The body of the harrow.
- D Hutwa. Two handles at each end of the above.
- E Ankra.—Two hooks fixed behind the body for attaching the rope.
- F Danta.—The four prongs of the harrow.
- G Fulwa.—The iron shares of the end of the prongs.
- H Sumra or Della.—The shaft.
- I Joosra.—Yoke.
- J Somul.—A wooden peg, for fixing the bands round the necks of the oxen to.
- K Naree.—Leather thong for binding the yoke to the shaft. It is generally ten cubits long.

This machine is $3\frac{1}{2}$ feet in breadth, between the two outer prongs, and stands 3 feet 8 inches high.

The cost of a sowing machine, or wawuneeah, or chawur, is as follows :

	Rs.	a.	p.
The shaft, dandee	0	12	0
The log or body, loreca	1	0	0
Four shares or teeth, four danta	0	8	0
A bowl with four tubes of bamboo, manah and four dandwa..	0	8	0
Yoke	0	8	0
Cotton rope for tying the bowl	0	2	0
The four shares or teeth, tipped with iron from spare pieces of old iron in the house, but if purchased costs	0	4	0
Total....	Rs.	3	10 0

The sumar, a flat piece of wood for covering the grain and smoothing the soil, is generally made of raen wood, and costs from Rs. 2 to $2\frac{1}{2}$ each; if of babool wood, it cost Rs. $1\frac{1}{2}$. Only these two sorts of wood are used; no others are found here to answer the purpose.

The lighter description of sumar serves for the goraroo soil, which is light; in the black heavy soils, the heavier description is used.

The driver stands on the log to aid its effect by his weight ; sometimes one or two others assist by their weight, sitting on the log and holding by the traces.

The Rampree and Hatheca.—The weeding plough, or hoe, for clearing weeds and stubble from land preparing for cultivation, and for weeding between the furrows after the grain is up. This implement is of different sizes : the largest kind is the ramp, the blade of which is sometimes as wide as $3\frac{1}{2}$ feet, and is used principally for clearing heavy black soils. The hatheca is smaller, and used similarly for lighter soils. The rampree is the smallest kind, and used for weeding between the furrows when the grain is about a foot high. The breadth of the blade is adjusted to the size of the sowing machine, generally about 10 inches wide. The danda is hollow, and the blade has a prong at each side, which fits into the danda, so that it is removable at pleasure for sharpening, repairing, &c.

References to the Native Names of the different parts of the Rampree.

- A The loreca.
- B The danda of iron, $\frac{1}{2}$ inch thick.
- C The paunseca, or blade.
- D The della, or shaft.
- E The joosra, or yoke.
- F The somul, four wooden pegs for the neck bands.
- G The narce, leather rope for tying the yoke to the shaft.
- H The hatha, or handle.

The cost of a rampree is about Rs. $2\frac{1}{2}$.

The carts in general use are very commodious, and 16 Indian maunds are reckoned a load for a cart with two bullocks.

The *Cart No. 1* is a plain platform cart, known by the name of redwa, in common use for carting bricks and firewood in and about the city of Ahmedabad. It costs, if made of babool wood, from Rs. 30 to 40, but if made of blackwood, about Rs. 60. The wheels have no iron tires. The thickness of the wheels is 6 inches, and diameter 3 feet 9 inches. A pair of wheels costs from Rs. 12 to 14.

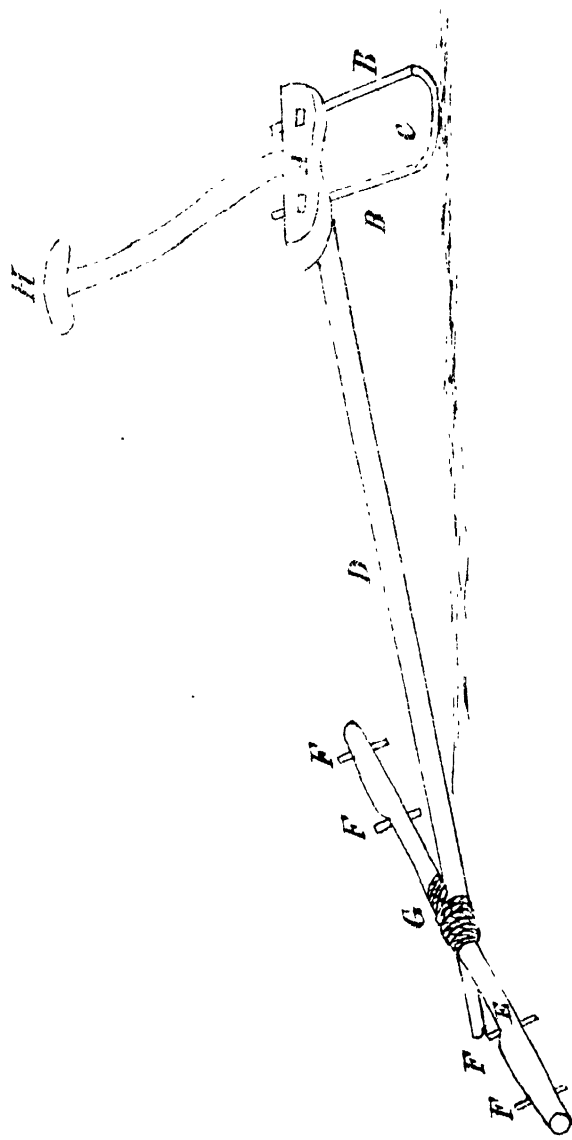
Cart No. 2 is of the same make as the above, but here is fitted with a matting made of the cotton plant stalks, and often of the tooer plant stalks, running all round, except the back of the cart. This matting forms the sides, and is removable at pleasure. When the matting is put on, the driver sits forward, as represented.

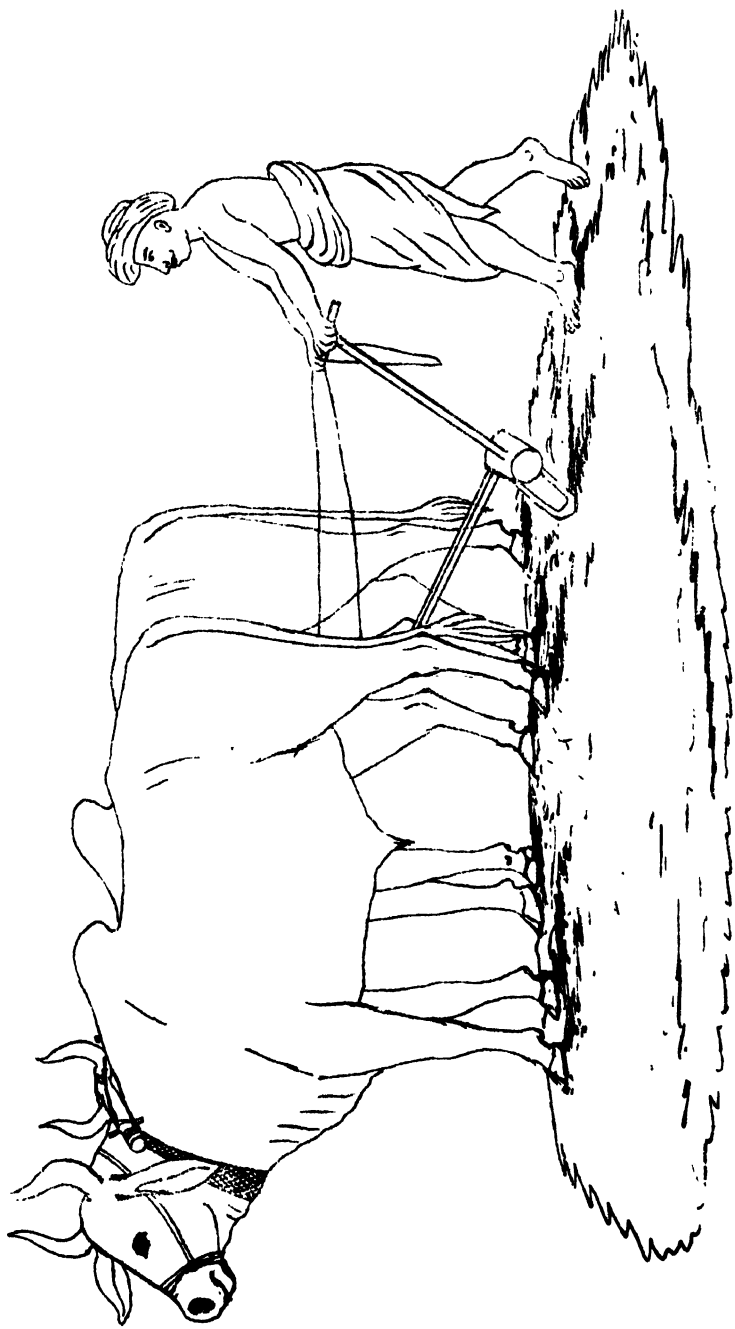
These carts are used by travellers in Guzerat ; but there is another sort of cart called chukra. A description and sketch of it is given. (No. 6.)

The turreela is an extra yoke for putting more bullocks than two to a cart. In yoking, the end pegs are removed, and replaced when the bullock's neck is properly situated. It is also used for a single pair of bullocks in working wells. It is attached by traces to the notch in the pole at the place marked **a** in Sketch No. 1. The wood-work costs 12 annas, and the leather traces Rs. $1\frac{1}{2}$, total Rs. $2\frac{1}{2}$.

Cart No. 3 is a somewhat stronger made cart than the redwa, with a number of iron clamps about the mortices, which make it more durable, and is therefore more expensive. It is common to the Gogo side of this Collectorate,

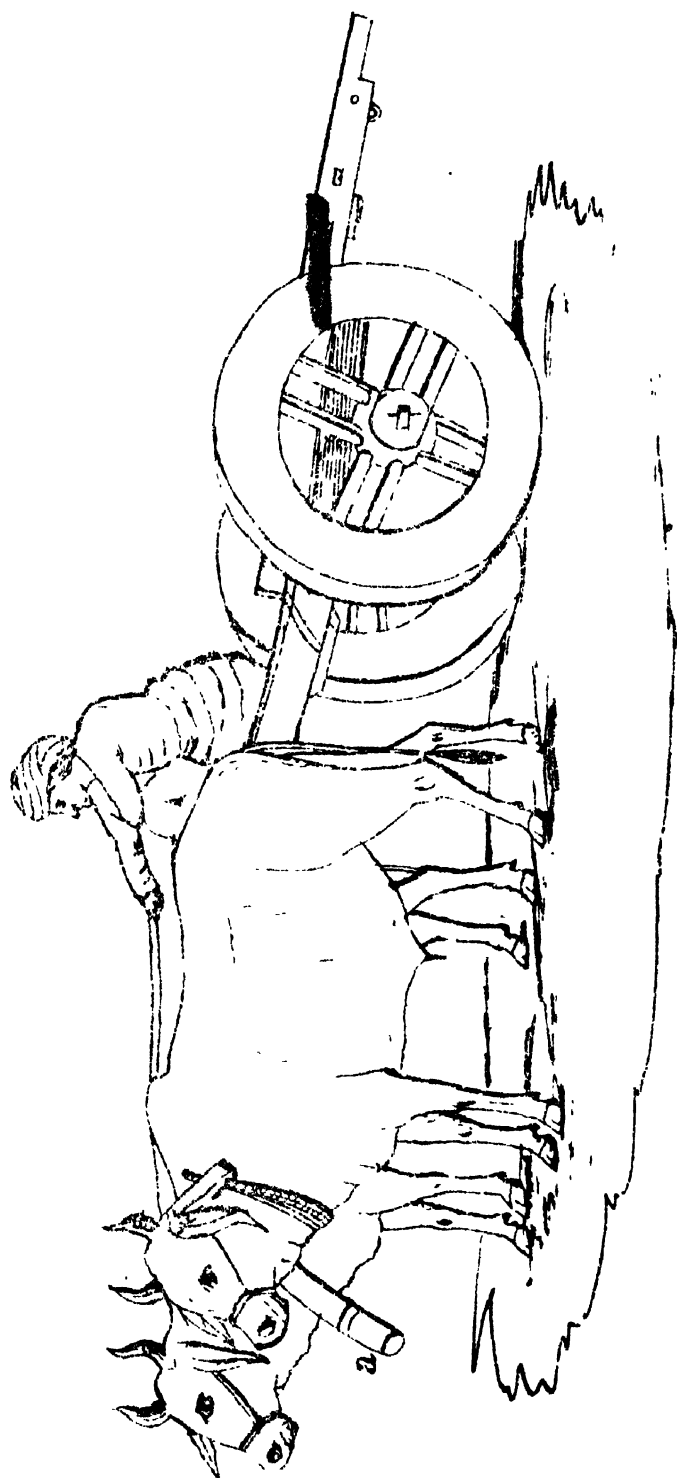
The Rampage or Railhoe

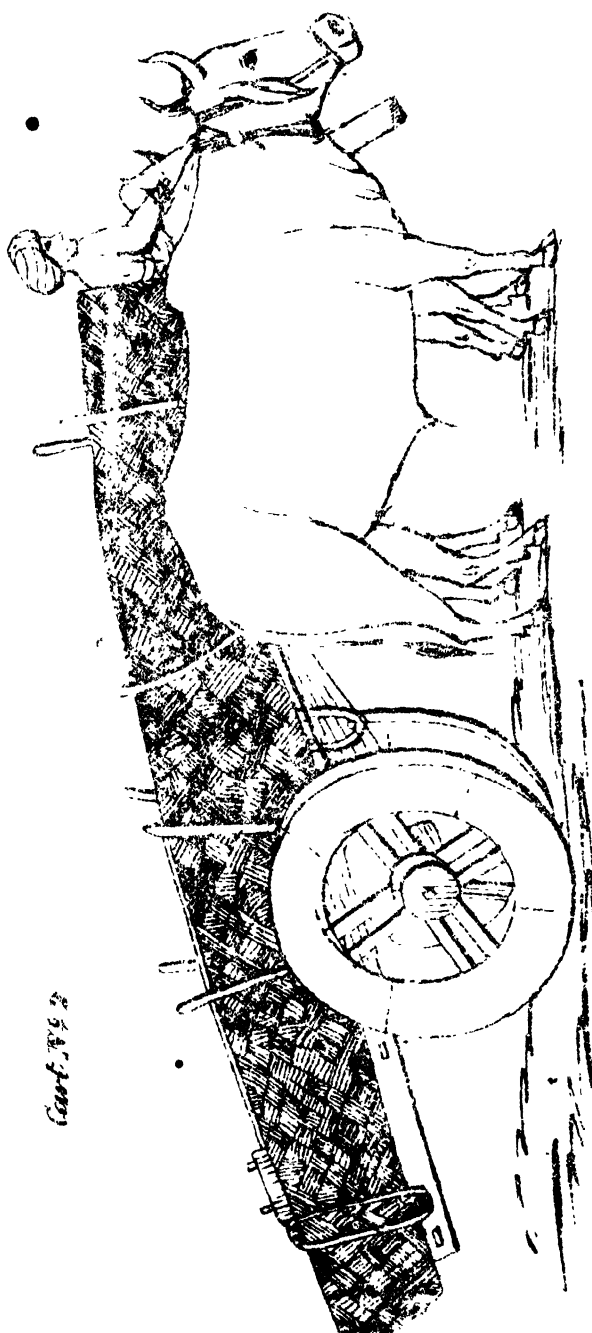




The Rampree in use.

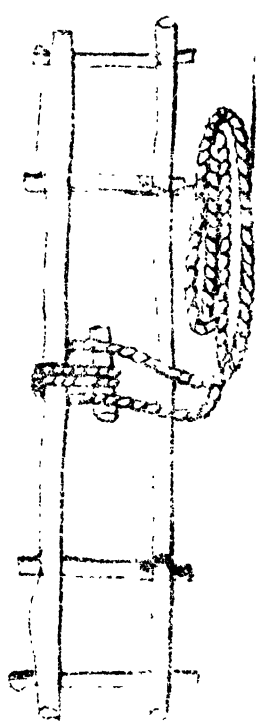
Числ. 3791





Cart, No. 2

The Florida.

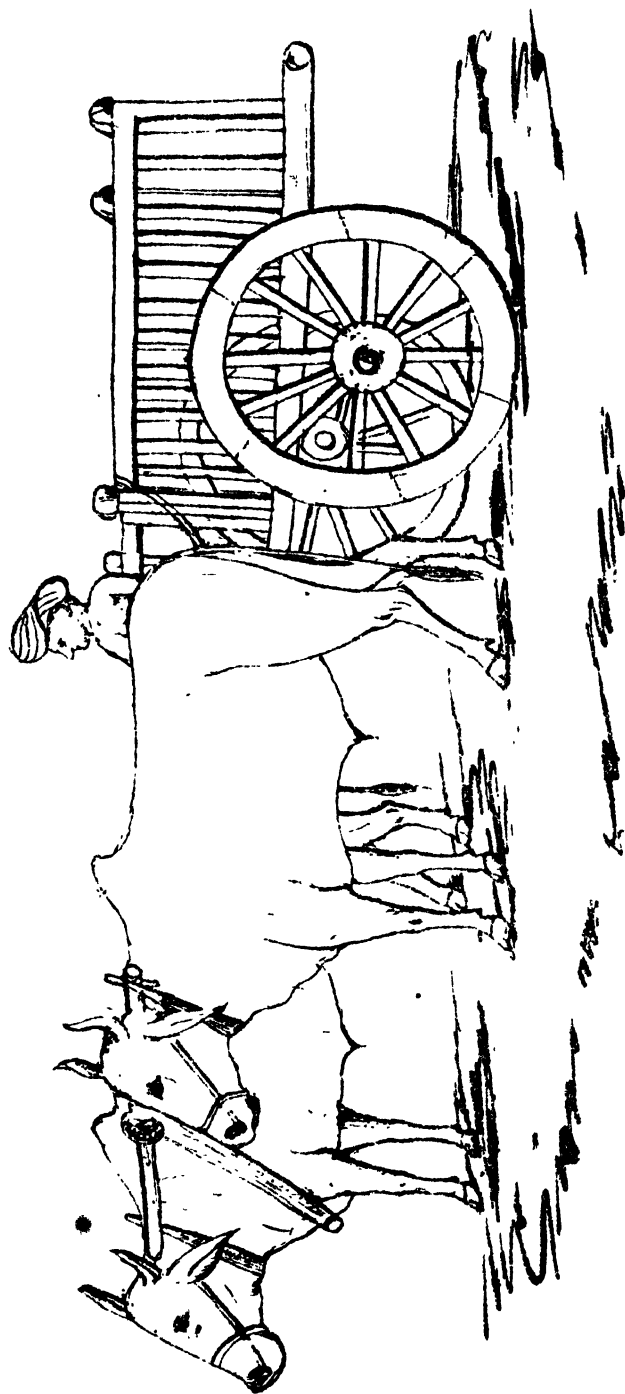


5 1/2 feet long.

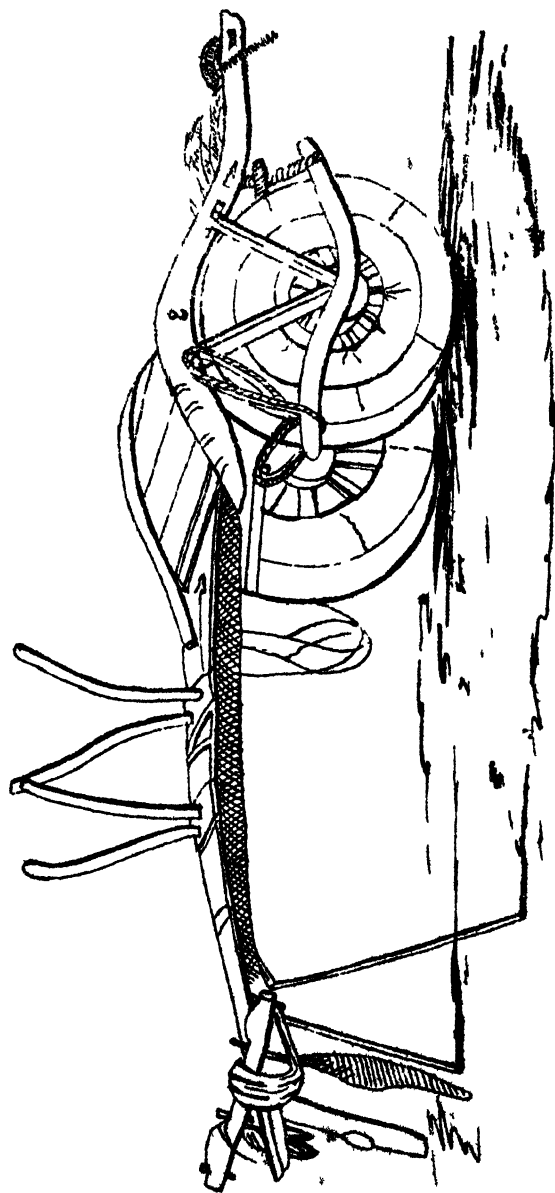
Figure 1



Cart N^o 4.

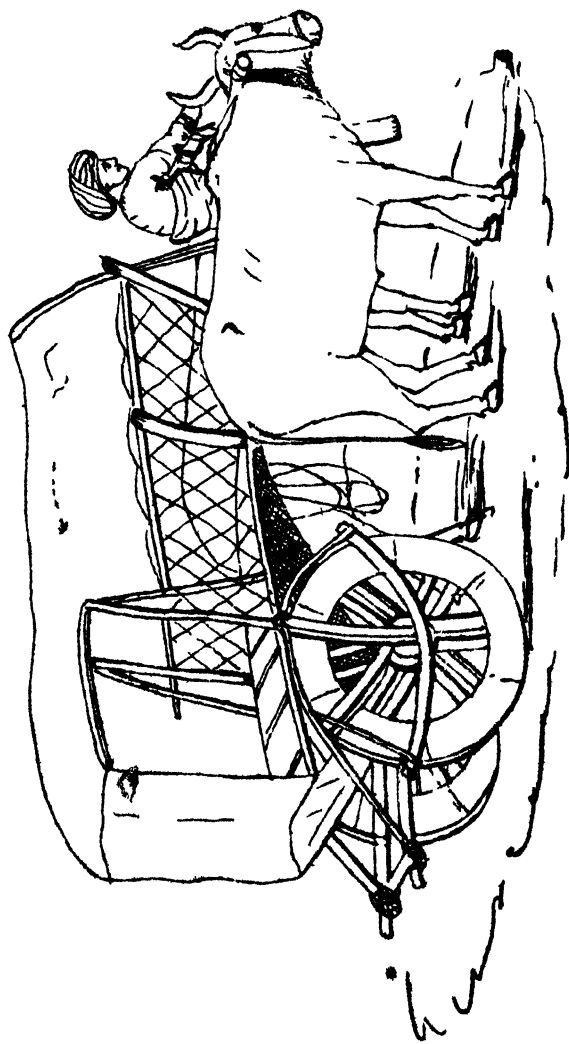


Cart № 5.



Marware Cart at the Gogo Bunder.

Cart No. 6.



The Chakora.

where, from the stony nature of the soil, more strength is required. The mode of fixing the wheels is peculiar: the axle-tree does not run right across from wheel to wheel, but from the supports represented outside; a small iron peg, about three-quarters of an inch in diameter, and 1 foot 8 inches long, runs through the wheel into a piece of wood placed to receive it on the inside.

Cart No. 4 is called the *dumnee*, and is in general use in the port of Gogo and its vicinity. Similar carts are common on the opposite coast of Surat.

Cart No. 5 is a cart from the Marwaree country, which has the peculiarity of a curved platform: it is sometimes fitted with matting sides, in the mode represented in No. 2. It has also the peculiar axle mentioned in No. 3, with a slight alteration of the position of the supports.

Cart No. 6.—This cart is generally used for travelling. It is called *chukra*, from having six spokes to the wheels, which are so made as to go completely through the nave, passing at the side of the axle, which is of the peculiar form above described. The wheels of these carts have iron tires. They carry four persons, with a quantity of baggage stowed in different parts: sometimes, however, they are seen with twice as many passengers stowed into them. These carts are also used for carrying merely burdens, but then the top is usually taken away.

PRICES OF PRINCIPAL PRODUCTS.

The following statement of the principal products of this zillah is obtained from the records of the Foujdar of Ahmedabad.

The statement gives the prices of grain for the month of March, when the market is well supplied from the previous harvest.

Statement of Prices of Grain in the City of Ahmedabad, for the Month of March, for Ten Years, showing the Quantity sold per One Company's Rupee in Indian Weights.

	1838	1839	1840	1841	1842	1843	1844	1845	1846	1847	1848	
	Md.	Sr.	Md.	Sr.	Md.	Sr.	Md.	Sr.	Md.	Sr.	Md.	Sr.
Bajree, 1st sort	0 24	0 18	0 26	0 32	0 28	0 32	0 35	0 35	0 26	0 28	0 39	
Bajree, 2nd sort	0 27	0 19	0 28	0 31	0 31	0 34	0 38	0 38	0 28	0 29	1 0	
Rice, 1st sort (kumode) . . .	0 21	0 15	0 16	0 17	0 17	0 17	0 23	0 25	0 20	0 25	0 25	
Rice, 2nd sort (elachee) . . .	0 25	0 16	0 18	0 19	0 21	0 21	0 27	0 29	0 23	0 30	0 30	
Rice, 3rd sort (sootursal) . .	0 28	0 17	0 20	0 21	0 22	0 24	0 31	0 34	0 23	0 35	0 33	
Rice, 1th sort (sathee) . . .	0 29	0 26	0 27	0 27	0 32	0 37	0 38	1 2	0 35	1 2	1 5	
Wheat, irrigated	0 24	0 18	0 23	0 27	0 27	0 30	0 36	0 26	0 23	0 23	0 28	
Wheat, chosna, unirrigated .	0 22	0 15	0 20	0 25	0 22	0 29	0 34	0 24	0 20	0 21	0 26	
Mutt	0 34	0 20	0 29	0 33	0 36	1 3	1 4	1 4	0 33	1 5	1 10	
Mug	0 28	0 14	0 22	0 22	0 27	0 36	0 39	0 37	0 23	0 35	1 1	
Ureed	0 27	0 15	0 22	0 23	0 27	0 29	0 36	0 38	0 23	0 30	1 1	
Gram	0 30	0 14	0 20	0 17	0 22	0 29	0 34	0 29	0 17	0 20	0 31	
Dholl	0 27	0 15	0 22	0 20	0 31	0 26	0 27	0 37	0 24	0 28	0 22	
Joowar	0 31	0 21	0 32	0 33	0 36	1 3	1 4	1 3	0 30	0 37	1 8	

*List of Grain, &c. forming the Khureef, the Rubhee, and the Hurree Crops, &c.
in the Collectorate of Ahmedabad.*

Crops.	Grain, &c.	Time of Sowing.	Time of Produce coming to Maturity.
Land producing valuable Crops, called Malecat.	Sugar-cane	April.	February.
	Plantain	August.	August.
	Pomegranate	"	June.
	Guavas	"	November.
	Figs	June.	December.
	Ginger	"	October.
	Garlic	October.	March.
	Country Potatoes	June.	October.
	Turmeric	"	Oct. & Nov.
	Lemon.	"	October.
	Brinjal.	August.	November.
	Tobacco (irrigated)	October.	March.
	Grapes	August.	November.
	A kind of Yam	May.	December.
	Chilie	August.	November.
	Sweet Potatoes	May.	January.
	Karelee	November.	March.
	Yam	May.	January.
	Kasmeir	June.	October.
Monsoon Crop, Khureef.	Rice, 1st sort (kanode)	September.	November.
	Rice, 2nd sort (elachee)	August.	October.
	Rice, 3rd sort (sootur-al)	"	"
	Rice, 1th sort (sathee)	July.	"
	Bayree.	"	"
	Joowar.	July & Aug.	Oct. & Nov.
	Buota.	July.	October.
	Bunthe	"	"
	Mutt	"	"
	Sesamum	"	"
	Kodra	"	"
	Maize.	"	"
	Hemp.	"	December.
	Walore	"	October.
	Indigo.	"	"
	Mug	"	"
	Freed.	"	"
	Bhenda	Nov. & May.	May & July.
	Korah.	Feb. & June.	May & Sept.
	Chola	July.	October.
	Cucumber	"	September.
	Gowar.	"	"
	Toor	"	"
	Tooreea	May & Dec.	Aug. & May.
	Sercea Bhenda	July.	January.
	Wal or Jholar	"	September.
	Kulthee	"	November.
	Ratureco Joowar	"	October.
	Tobacco (unirrigated)	August.	December.
	Bhang	July.	February.

Crops.	Grain, &c.				Time of Sowing.	Time of Produce coming to Maturity.
Rubber, or Cold Weather Crop.	Barley . . . . .	..	..	..	November.	March.
	Wheat (irrigated) . . . . .	..	..	..	"	"
	Wheat (unirrigated) . . . . .	..	..	..	October.	"
	Toor . . . . .	..	..	..	November.	"
	Safflower . . . . .	..	..	..	September.	"
	Toowar (secaloo) . . . . .	..	..	..	October.	"
	Tandulja (a vegetable) . . . . .	..	..	{	Sown at all times.	{ Is ready for reaping in the space of one month.
	Sooa . . . . .	..	..	..	July.	December.
	Mustard . . . . .	..	..	..	November.	March.
	Jeeroo . . . . .	..	..	..	"	"
	Vurecalu (fennel) . . . . .	..	..	..	July.	February.
	Assaleca . . . . .	..	..	..	November.	March.
	Coriander . . . . .	..	..	..	"	February.
	Gram . . . . .	..	..	..	October.	"
	Carrot . . . . .	..	..	..	November.	"
	Sesamum . . . . .	..	..	..	October.	January.
	Castor Oil Plant . . . . .	..	..	{	July, Sept., & Nov.	Dec., Apr., & May.
	Cotton . . . . .	..	..	..	July.	March.
	Wetana (peas) . . . . .	..	..	..	November.	January.
	Rajgurroo . . . . .	..	..	..	February.	June.
	Kaung . . . . .	..	..	..	November.	February.
	Methee . . . . .	..	..	..	September.	November.
	Raddish . . . . .	..	..	..	"	"
	Mogreeo . . . . .	..	..	..	"	"
Hurree Crop.	Onion . . . . .	..	..	..	January.	May.
	Dhoodhee . . . . .	..	..	..	June.	August.
	Potatoes . . . . .	..	..	..	November.	February.
	Joowar . . . . .	..	..	..	March & April.	May & June.
	Kaung . . . . .	..	..	..	"	"
	Gram . . . . .	..	..	..	"	"
	Kohulla . . . . .	..	..	..	"	"
	Aureca and Kotumra . . . . .	..	..	..	"	"
	Mug (sown in the river sand) . . . . .	..	..	..	"	"
	Water Melon . . . . .	..	..	..	"	"
	Kulungra and Khurbooje . . . . .	..	..	..	"	"
	Thek . . . . .	..	..	..	"	"
	Ureed (sown in the river sand) . . . . .	..	..	..	"	"

TENURE AND OCCUPATION.

The variety of tenures under which lands are occupied by the inhabitants of the Ahmedabad zillah are noticed below, as extracted from the records of the Revenue Survey, by which department a strict scrutiny was made of the real nature of each tenure.

The following is a list of terms under which lands are held, explaining the nature of each. It is extracted from a glossary of revenue terms framed by Lieut. (now Lieut. Col.) P. M. Melvill, of the late Revenue Survey Department of Guzerat.

“ *Buthamneea*.—A tenure under which portions of alienated land are held. This tenure is supposed to have originated in the forcible seizure of fields by Kolees, Rajpoots, and other lawless characters, during disturbed periods ; who pointed out (buthana) the land they wished to possess, and supported possession by the sword, till custom had confirmed the usurpation.

“ *Chakreea*.—Land set apart for maintenance of the village servants (chakur) and establishment.

“ *Guraneea*.—Land mortgaged, either for a fixed period, at the end of which the land is to revert to the mortgager ; or to be held by the mortgagee until the original purchase-money be repaid, sometimes without interest ; or until the rent of the land shall have repaid the whole of the debt contracted.

“ *Inam*.—A term applicable only to whole villages, and signifying that the village is alienated, and held by some private individual, most commonly a Mussulman.

“ *Jeewace*.—Land made over free of rent to his servants and dependents by the Talookdar of a village. This term (confined to the talooka villages) does not appear strictly cognizable by Government, it being a private provision made by the Talookdar for services performed to himself personally, and not to Government.

“ *Khalsa*.—Government, pertaining to the State. Khalsa in the Dholka purgunna is used to distinguish those villages which are held under the direct management of Government from the talooka, or those held by the Kusbatees and Guraseeas.

“ *Kherat*.—A term applied to villages alienated for the support of temples, or other religious purposes.

“ *Kothlee Sant*.—Alienated land resumed, but in compensation for which a money payment is annually made to the original holders, from the Government kutcheree. This payment may be varied, continuing either during one life, or during two or more lives.

“ *Talooka*.—Villages held on a perpetual and hereditary lease, the holders of which are entitled to a certain per-centage on the Government revenue, and, so long as they regularly discharge the payments and services required from them, to the internal management of their villages, and the collections ; but if the Government be dissatisfied with the Talookdar, it is in its power to attach the village, making all the collections through the agency of its own officers, and returning to the Talookdar the proportion which is his right. The talooka villages of the Dholka purgunna are held by Waghela Rajpoots and Mussulman Kusbatees. The share of the revenue to which they are considered as entitled was, in 1821, by the order of Government, increased from 20 to 30 per cent.

“ *Tulput*.—Government land, used in the Dholka purgunna particularly in opposition to the wanta prefixed to any alienated tenure (as tulput vechaneca, wanta pussacta, &c.). Distinguishes the land as alienated from the Sirkaree or wanta portions of the villages.

"Vechanee."—Land sold. Derived from bechna to sell. A tenure under which much of the alienated land in the Ahmedabad Collectorate is held.

"Wantu."—Land held by Gurasees. It is probable that at the Mussulman conquest, the Rajpoots, before lords of the whole territory, were allowed to retain a portion or share (bant) of each village for their subsistence, and that hence has arisen the term exclusively applied to their lands.

"Wuzeefu."—Land held by Syuds and other Mussulmans, generally in virtue of sunnuds from the Court of Delhi. The derivation of the word seems to be wuzee, produce."

Besides the above-mentioned are other tenures, viz :—

Dhurmada.—Lands given in charity, synonymous with kherat.

Dewasthan.—Lands given for support of temples.

Runwutcea or Seer.—Lands in the possession of persons whose forefathers fell in action with an enemy.

Huleea.—Lands enjoyed as compensation to the family of persons killed.

These tenures are generally of three kinds, called nukroo suwadeea, or sulameea. The first, nukra, is free from the payment of any revenue whatever; suwadeea is a cess paid when the land is cultivated, not by the proprietor, but by a Government ryot; sulamee is a quit-rent, payable by the proprietor when the land is cultivated, and in some cases without reference to cultivation.

Barkhullee is a general term for alienated land. It appears to be derived from बाहेर without, and खली the stack-yard. The produce of Government lands are commonly brought into a general stack-yard, when the Government share is set apart; but the produce of alienated land not being liable to pay a share, need not be brought to the stack-yard, and hence, apparently, the term has arisen.

MODES AND RATES OF ASSESSMENT.

A revenue survey was made of a considerable part of the soubehdaree of Guzerat, and the different kinds of lands assessed according to their qualities, during the reign of Akbar of Delhi, by Rajah Todar Mull, when Khané Azim Meerza Kokultash was Soubehdar of Guzerat. This survey was begun in A. H. 984 (A. D. 1576), and was revised and corrected by Nawab Shabooddeen Khan, the Soubehdar of Guzerat, during the same reign, about fifteen or twenty years afterwards. The records of this survey are preserved at Ahmedabad in the office of the Padshahie Dewan. Some particulars are as follows :—

The soubehdaree of Guzerat was divided into ten sircars, of which the sircar of Surat was one, but was always managed separate, and no records respecting it were preserved; the other nine sircars were Ahmedabad, Baroda, Champa-neer, Godra, Puttun, Islamgur (now called Nuwanuggur), Broach, Nandode, and Soruth.

The Ahmedabad sircar contained 29 purgunnas, and two ports, as follows :—Matur, Azimabad, *Edur*, *Ahmednuggur*, Bahual, *Puranteje*, *Burpoor*,

Ballasinoor, Peeplode, Veerungaum, Thanna, Pitlad, Jhalawar, Hydrabad, Dholka, Dhundooka, Soomat, Bamnolee, Kuppurwunj, Kurree, Morassa, Megraj, Mehmordabad, Nurecad, Moondah, Meymoorabad, Hursole, chorassee of Cambay, huwelee of Ahmedabad, the ports of Cambay and Gogo.

Of the above-mentioned purgunnas, 17 were measured and 12 were not, in consequence of being in the hands of Zumeendars, and in a state of disorder; these were those which are in Italics, thus: *Edur, Ahmednuggur, &c.* From the above detail it appears that only two purgunnas now under this Collectorate, viz. Dholka and Duskrohie (or as then called huwelee of Ahmedabad), were then surveyed, the others being in the hands of Zumeendars too turbulent to allow it.

The records of this survey only give the total amount of the different qualities of land in each village, without any further particulars. Copies of them can be procured at any time.

There is no certain information recorded of the measurement adopted by the survey, but tradition represents it to have been on the principle laid down in the Hindoo Jotesh Shastree:—5 cubits, measured by the arms of five different men, formed 1 wiswussa, 20 wiswassas 1 wussa, and a square measuring 20 wussas each way was a beega.

The most irregular figures are reduced to the simple calculation of squares by measuring every place where the figure varies in breadth, adding the whole together, and dividing by the number of measurements for the average breadth: the same operation is performed to ascertain the medium length, and the square of these two sums is taken as the contents of the figure.

The survey was acted on during the reign of Akbar, and until the death of Aurungzebe, after which it fell into disuse.

In the year A. D. 1819-20, a Revenue Survey Department was established by Government, and five purgunnas, according to the present divisions, viz. Dholka, Ahmedabad and Jetulpoor Duskrohies, Veerungaum, and Puranteje, underwent a regular survey; but only the boundaries of the mehwassee, talookdaree, and kusbatee villages were laid down.

The following extract of the introduction to the revenue survey report on the Duskrohie purgunna is explanatory of the size and proportion of the beega of the Ahmedabad Collectorate:—

“ Throughout the whole of the Ahmedabad Collectorate, and the eastern zillah north of the Mahee river, lands are measured, and accounts kept in beegas, wussas, and wiswassas: 20 wiswassas form 1 wussa, and 20 wussas 1 beega; the beega, like the English acre, being entirely a square measure. Prior to the survey, no common standard for the length of the hath or cubit existed. After a careful and thorough investigation and inquiry by the late Colonel Monier Williams (Surveyor General), the length of the guntha was determined and fixed, upon an average of rods received from ten different purgunnas, at 96 inches, or 8 feet exactly, and the length of the hath at 19½ inches.

"The beega, therefore, now considered as the Government standard beega for the zillah of Ahmedabad and Kaira, contains 25,600 square feet, the wussa 1,280 square feet, the wiswussa 64 square feet. As an English statute acre contains 43,560 square feet, it follows that one such standard beega is equal to 5876951 decimal parts of an acre, or that one acre is equal to 1 beega, 14 wussas, and 62 decimal parts of a wiswussa."

	Square Inches.		Square Inches:
A beega is equal to..	3,686,400	An acre is equal to.....	6,272,640
A wussa is equal to..	184,320	A rood	1,568,160
A wiswussa equal to ..	9,260	A perch	39,204
One English square mile contains 640 acres, or 1,089 beegas.			

The following memorandum gives a specimen of the various descriptions of the assessment now prevailing, which it is intended to supersede by an annual rate per beega, according to the capability of the soil. This work is now in progress, and has been introduced in 92 villages of the Collectorate, and the proceedings of revision in 175 villages are now pending the sanction of Government :—

1. PURGUNNA JETULPOOR, VILLAGE PINGLUJ.

JINUSWAR BEEGOTEE, OR RATES ACCORDING TO CROP.

Malleeat (Produce of superior description).

On sugar-cane, per beega.....Rs. 9 5 0

Khureef (Monsoon Crop).

On dangur or rice as follows :—

Uwul (1st class land), per beega	Rs. 8 6 0
Doyum (2nd class land), ditto	7 7 0
Soyum (3rd class land), ditto	6 8 0
On sathee dangur (coarse rice), raised on any land above classified, ditto	3 12 0
On joowar and bajree, in goraroo land, ditto	1 6 0
Ditto ditto, cultivated by Oopurwureas (non-resident cultivators), ditto.....	1 3 0

The following rates are taken on lands which have been resumed by Government, if cultivated with dangur (rice):—

Uwul.....	Rs. 4 10 0
Doyum	3 12 0
Soyum	2 13 0
On sathee (coarse rice), raised on any of the lands above classified.....	2 5 0
On joowar and bajree raised on goraroo land.....	0 11 0

Rubbee (Second or Cold Weather Crop).

On Government sankhey* land, cultivated with jow (barley), and gaon (wheat).....	Rs. 3 12 0
Vawavara, or lands from which a khureef (monsoon) crop has already been taken	2 13 0
On lands resumed, cultivated with jow (barley), and gaon (wheat), if sankhey, <i>i. e.</i> the land not having been previously cultivated with a khureef crop	2 5 0
Vawavara (as above).....	1 10 0

Hurree (Third or Hot Weather Crop).

Sankhey or vawavara.....	0 15 0
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2. PURGUNNA AHMEDABAD DUSKROHIE, VILLAGE NUDEECHIA.

KHATABUNDEE (OR LEASEHOLD).

Two khatae, or holdings, which are leased from Sumwut 1897 (A. D. 1840-41) to Sumwut 1906 (A. D. 1849-50). The rates levied on each khata are as follows :—

First Lessee, Patel Bhugwan Bajee.

	B. W. WW.	Oodhur Field Payment.
		Rs. a. p.
Field No. 2, named Kujanawalla	6 13 13 koovetur goraroo...	41 14 5
Field No. 5, named Kassum-khan Valla	13 4 10 ditto ditto ..	48 6 8
Field No. 6, named Akrao	3 17 7 ditto ditto ..	7 7 3
Field No. 9, named Veovo	16 8 1	
Deducting bad land	8 8 1 leaves 8 beegas....	8 0 0
Field No. 10, Rutawalla	10 4 8 koovetur goraroo ..	9 5 0
Field No. 13, Chintamun Bhow.	2 6 5 ditto ditto ..	9 5 5
Field No. 14, Nuderat	16 18 2 doyum rate	9 12 5
Nukree land (rent-free).....	4 18 16	134 8 10
Nugdeebab (ready money receipts), viz :—		
Tamarind	Rs. 0 14 11	
Surkut (giant grass).....	0 14 11	
		1 13 10
Total.....		136 6 8

* Land which has remained fallow during the monsoon, in order that the crops subsequently may be better.

Second Lessee, Bajee Purboodas.

						Oodhur Field Payment.		
Field No. 1, named	*	B. w. ww.				Rs.	a.	p.
Kujanawalla		4	13	11	koovetur goraroo ..	41	14	5
Field No. 3, Kosree		3	15	2	ditto ditto ..	26	1	2
Field No. 4, Kosree Bhondas								
Valloo		3	19	11	ditto ditto ..	27	0	0
Field No. 7, Veeas Valloo		7	15	11	ditto ditto ..	12	1	8
Field No. 8, Kitta Akurrwo ..		8	8	16	ditto ditto ..	8	6	1
Field No. 13, Chintamun Bhow.		2	6	15	ditto ditto ..	9	5	0
Field No. 14, Nuderat		17	8	7	soyum rate	9	12	5
						<hr/>		
Nukree land (rent-free) ... , ..		4	18	16	.....	134	8	9
Nugdeebab (ready money receipts), viz :—								
Tamarind						Rs.	0	14 11
Surkut (giant grass)							0	14 11
						<hr/>		
						1 13 10		
						<hr/>		
Total						136	6	7

3. PURGUNNA AHMEDABAD DUSKROHIE, VILLAGE CHUROREE.

FIXED AMOUNT ON PLOUGH.

Government Land.

If a Rajpoot, Koonbee, or Kolee resident of the village, cultivates, within the Government or barkhullee land, with joowar, bajree, dangur (rice), and sathee, khureef crops, or barley and wheat, rubbee crops, he pays an oodhur hull (or a fixed amount on the plough). If sugar-cane, chillie, brinjal, &c. are cultivated in malleeat land, a beegotee would be taken as well as oodhur hull (fixed payment for plough) ; but at present, as no such cultivation has been made, no beegotee has been fixed.

The amount taken on each oodhur hull (fixed plough) is as follows :—

7 Hull (ploughs)*at Sicca Rs. 25 each.

1 Hull (plough) is allowed to Puggees Godhur Ghella, Juvier Bhaloo, &c. on account of chakreeat (service).

1½ Hull (plough) at Sicca Rs. 20, or Co.'s Rs. 18-10-0 each.

2 Hull (ploughs) at Sicca Rs. 17-8-0 each.

2 Hull (ploughs) at Sicca Rs. 15 each.

4½ Hull (ploughs) at Sicca Rs. 17-8-0 each.

18 Hull or ploughs.

If a cultivator has no plough of his own, and hires one, or cultivates land with the kodulee (pick-axe), a beegotee is taken on joowar and bajree crops, at 15 annas per beega ; on dangur (rice) and sathee (coarse rice) one-third share is taken.

* Not intelligible in the MS.

Rates levied from Oopurwurceas, or non-resident ryots, are as follows :—

On joowar and bajree 15 annas per beega.

On sathee (coarse rice), one-third share.

4. PURGUNNA AHMEDABAD DUSKROHIE, VILLAGE CHUNDLOREEA.

KHATABUNDEE AND JINUSWAR.

A Pataedar cultivating 16 beegas of land (being the extent of his holding) pays Sicca Rs. 41 or Co.'s Rs. 38-2-10 : of this, 4 beegas at Rs. 4, 7 beegas at Rs. 2-8-0, and 5 beegas at Rs. 1-8-0 per beega. If more land is cultivated, Rs. 1-3-0 per beega is taken on the excess; if less land is cultivated, the highest rate on joowar and bajree is taken. A Koonbee cultivating 16 beegas pays Sicca Rs. 37 or Co.'s Rs. 34-7-3 on joowar and bajree crops of this 6 beegas at Rs. 3, 4 beegas at Rs. 2-8-0, and 6 beegas at Rs. 1-8-0. If more land is cultivated, Rs. 1-3-0 per beega is taken on the excess; if less then the highest rate is taken.

A Kolee cultivating 10 beegas of land pays Sicca Rs. 22-8-0, at the rate of Rs. 2-4-0 per beega, or Co.'s Rs. 20-15-2. If more land is cultivated, 15 annas per beega is taken on the excess.

A Lohar (blacksmith) cultivating 18 beegas pays Sicca Rs. 37, or Co.'s Rs. 34-7-3. Of this 5 beegas at Rs. 3, 2½ beegas at Rs. 2-8-0, and 10½ beegas at Rs. 1-8-0 per beega. If more land is cultivated, Rs. 1-3-0 per beega is taken on the excess; if less, then the highest rate is taken. If widows cultivate land with joowar or bajree, not with the regular agricultural implements, but with the kodulee (pick-axe), or go in shares, &c. they pay Co.'s Rs. 2-2-0 per beega.

If a ryot cultivates joowar or bajree in the new puttur (waste) land, for the first year 15 annas per beega, and Rs. 1-3-0 for the following year is taken. If dangur (rice) is raised, Rs. 4-10-0 per beega is taken. If other kinds of dangur (rice), such as sootursal, elachee, &c. are cultivated, Co.'s Rs. 3-12-0 per beega are taken; on sathee (coarse rice) Rs. 1-14-0 per beega is taken. If on rubbee, sankhey (fallow), and vawavara (a second crop), bailey and wheat, castor oil plant, onions, and safflower are cultivated, Co.'s Rs. 2-5-0 per beega are taken. If hurree (hot weather crop), 15 annas per beega.

In chakreest (service) land, if rubbee crops are raised, a vera (cess) of 15 annas per beega is taken on each well.

5. PURGUNNA AHMEDABAD DUSKROHIE, VILLAGE

RUKEELKHOORD.

JINUSWAR BEEGOTEE.

Fixed Payment on Fields.

	B.	W.	WW.	Rs.	a.	p.
No. 3, Kitta Lallkhan Valla, doyum koovetur ..	13	8	3	55	14	0
No. 4, Kitta Vanee Valla, ditto	14	11	17	69	13	0
No 11, Kitta Kaye, ditto	10	2	19	20	8	0

	B.	w.	ww.	Rs.	a.	p.
No. 12, Veejra Valla, doyum koovetur.....	6	3	11	31	10	0
No. 13, Mota Kovah, ditto	13	17	17	56	13	0
No. 14, Kitta Keye Rajewalla, ditto.....	9	13	9	26	1	8
No. 24, Kitta Gunga Kooee (guraneea land) ..	19	13	8	1	14	0

Oodhur Kuthra, or Field of Pandur Goraroo Land, cultivated with Joowar, Bajree, &c.

	B.	w.	ww.
No. 1, Gainshullen Uwul, goraroo.....	8	9	19
No. 9, Soyum, ditto	3	19	4
No. 10, Kitta Arr, ditto	14	10	3
No. 17, Kitta Pulvar Valla, ditto.....	8	4	0
No. 8, Sonareo, ditto	5	3	11

On other lands, a beegotee on joowar and bajree is taken at the rate of Rs. 1-3-0 per beega.

5. PURGUNNA AHMEDABAD DUSKROHIE, VILLAGE WUSTRAPOOR.

BHAGBUTTAE AND JINUSWAR.

	Rs.	a.	p.
On sugar-cane, per beega	9	5	0
On tobacco, ditto	5	10	0
On chillie and cucumber, ditto	3	12	0
On ginger, garlic, ulvee (country potatoes), brinjal, ochie, and guwar, ditto	2	13	0
Pateedars, cultivating 8 beegas of land with joowar or bajree, with one hull (plough) ditto	2	5	0
If more than 8 beegas Rs. 1-8-0 per beega on the excess.			
Koonbees and Kolees, old residents of the village, cultivating joowar, bajree, and kuthol, pay per beega.....	1	3	0
Pateedar Doongur Sondass, cultivating as much land as he can with joowar and bajree crops, pays per beega.....	1	14	0
Kolees of other villages residing in the village, and cultivating joowar and bajree crops, pay	1	1	0
Kurwa Koonbees of other villages newly established, and Ooperwureas (old), cultivating joowar, bajree, and kuthol, pay	0	15	0
If cultivation is made in karda (rice land), which was waste for the first year, 11 annas, and the following year according to the village dara rates, is taken on kong, cheena and joowar, hurree (hot weather) crops per beega	15	0	0

On doongur and sathree (khureef crops) one-third share is taken, and the other sareeka, a cess of one seer per maund, is taken from the ryot's share.

On barley and wheat (rubbee crops) cultivated from wells close to the village, a fourth share is taken, and the sareeka (cess) from the ryot's share.

7. PURGUNNA AHMEDABAD DUSKROHIE, VILLAGE HYBUTPOOR.

BHAGBUTTAEE, JINUSWAR, AND HULL VEERA.

On tobacco, brinjal, and chillie, raised in uwal (1st class) koovetur

land (irrigated land), Sicca Rs. 7, or per beega.....Co.'s Rs. 6 8 0

Khureef (Monsoon Crop).

The Koonbee Pateedar pays a beegotee, but the Kolee Pateedar pays an oodhur hull or fixed payment per plough as follows :—

Joowar and bajree raised in uwul koovetur goraroo pays Sicca

Rs. 3-4-0, or per beegaCo.'s Rs. 3 0 0

Ditto in doyum pays Sicca Rs. 2-2-0, or..... „ 2 0 0

Ditto in soyum pays Sicca Rs. 1-8-0, or..... „ 1 6 0

The Kolces pay for the oodhur hull (fixed payment on plough) Sicca Rs. 28-8-0 or Co.'s Rs. 26-9-0 on account of the old ploughs. They may cultivate as much Government land as one plough is capable of working with joowar or bajree crops.

On new ploughs Sicca Rs. 17, or Co.'s Rs. 15-13-0 are taken, on bhagellee land, i. e. land subject to pay a share in kind.

On dangur (rice) and sathee (coarse rice) one-third share is taken; the sareeka cess is taken from the ryot's share.

Rubbee (Cold Season Crop).

On wheat and barley, raised either on sankhey (fallow) land, with or without khureef crops, one-fourth share is taken; no babtees (cesses) are levied.

Hurree (Hot Weather Crop).

On kong, chuna, joowar, &c. raised either on sankhey (fallow) land, or vawavara (a second crop), 15 annas per beega is taken.

8. PURGUNNA VEERUMGAUM, VILLAGE NUWAGAUM.

BHAGBUTTAEE, HULL VEERA, &c.

Khureef (Monsoon Crop).

On bajree, joowar, buntce, kuthol, &c. cultivated by Patels and Wuswayeeas (village artisans) one-third share is taken; on waste land taken up, from a seventh to a third share is taken.

From the Wuswayeeas' share nowtank (one-eighth share) is taken per maund for dholi, and 2½ seers on account of dhurra (make weight) on each santee (plough). Buneas receive purbhara babtee (a fee) on account of weighing the nowtank and dhurra (make weight), which is taken from the ryot's share.

Rubbee (Second or Cold Weather Crop).

On wheat and barley a fourth share is taken from Patels, and on other kinds of grain a third share. From Wuswayeeas and others a third share is taken. Babtees taken from the Wuswayeeas are the same as stated under khureef (monsoon crops).

PURBHARA BABTEE (FEES).

The nowtankee dhurra and $2\frac{1}{2}$ seers on account of santee (plough) to the Bunniah who weighs the grain. The cultivators are allowed 3 seers on each maund on account of khor or residue after weighing. No hurree crops are raised. Under the head of nugdee veeras or miscellaneous ready money receipts, hull (plough) veera of 2 bullocks, is levied at the rate of Rs. 7-7-0 from the Bhagburra (people who pay a share). The Wuswaycees pay nothing, but the Wurtunees pay Rs. 3-12-0 fixed plough tax on 2 bullocks.

9. PURGUNNA PURANTEJE, VILLAGE GAROREE.

HULL VEERA (TAX ON PLOUGH), BHAGBUTTAEE (PAYMENT IN KIND), AND
FIXED AMOUNT ON PATCHES OF GROUND.

Khureef.

If grain crops are raised in fields Nos. 1, 14, and 15, and in the bad lands in waras (compounds), which has been made fit for cultivation by putting manure, and are situated close to the village, one-fourth share. If the villages and Oopurwurcees cultivate other land with grain crops they pay a fifth share.

Rubbee (Second or Cold Weather Crop).

On wheat, barley, and maize, a fifth share is taken.

Hurree.

Rates as above.

HULL VEERA (PLOUGH TAX).

The Koonbees pay from Rs. 2 to 4 each.

The Kolees pay from Rs. 1 to 2 ; if in poor circumstances, from 8 annas to Rs. 2 each.

BABTEES (CESSES).

The Sirkar's babtee of one seer per maund is taken from the ryot's share. The purbhara babtee of quarter seer per maund to the Bunniah who weighs the grain is also taken from the ryot's share.

In this village, when cultivation by walra (burning the jungle) is made, the Mookhee receives 10 seers of grain on each walra.

In this village 2 beegas are allowed for a wara (compound), for which 8 annas is taken ; also, on account of walra, 8 annas is taken.

The Nurwa villages are taken in the manner of a lease by the Patels, who pay in shares according to a previous settlement, but in cases of the failure of any of them the rest are answerable. The management of the village between the Patels and cultivators is conducted according to the original mode of assessment of the village, whatever it may be, so far that the Patels are not permitted to take more ; to take less is at their option.

*Abstract of the Description of Assessment prevailing in the Khalsa Villages
of the Collectorate on 1st January 1849.*

Subject.	Jeetupoor Duskrobie.	Ahmedabad Duskrobie.	Veerum r. um.	Dholka.	Puranteje.	Dhundooka.	Gogo.	Total.
Nurwa villages... ..	1	3	..	..	..	..	..	4
Uniform annual beegotee	21	23	38	4	32	..	4	122
Khatabundee	4	..	..	..	..	..	4
Fixed amount on ploughs	3	..	..	..	..	..	3
Jinuswar beegotee	19	57	..	31	..	..	..	107
Khatabundee and jinuswar	10	..	1	..	..	..	11
Fixed amount on wells & fields, & jinuswar.	..	6	..	..	..	..	..	6
Uniform annual beegotee on koovetur land, and on the rest jinuswar... ..	4	1	..	..	..	..	..	5
Fixed amount on wells and jinuswar...	1	..	..	..	..	..	1
Fixed rate on ploughs, bhagbuttaee and jinuswar	3	..	..	..	..	..	3
Fixed amount on wells, bhagbuttaee and jinuswar	2	..	..	..	..	..	2
Fixed amount on khureef, bhagbuttaee and jinuswar	2	..	..	..	..	..	2
Fixed amount on ploughs, and bhagbuttaee.	2	..	..	..	2
Bhagbuttaee...	1	3	32	19	4	..	59
Bhagbuttaee and jinuswar...	17	..	1	..	18
Bhagbuttaee and plough tax...	3	40	..	..	43
Bhagbuttaee and plough tax, and fixed rate on pieces of land attached to houses	27	..	..	27
Bhagbuttaee and plough tax levied on per- sons paying the share called "Bhag- burra": Wurtuneas, Kolees, &c. pay only plough tax...	21	..	..	..	..	21
Bhagbuttaee and plough tax on Wurtuneas, and if cultivated with rubbee Rs. 6-8-0 per beega...	1	..	..	..	..	1
Bhagbuttaee and plough tax on persohs paying the share called bhagburra, or Bhurteas	10	..	..	..	..	10
Bhagbuttaee and plough tax on persons paying the share called bhagburra, and on Kolees, &c. bhagbuttaee only...	1	..	..	..	..	1
Bhagbuttaee with babtee and plough tax on Wurtuneas...	2	..	..	..	..	2
Bhagbuttaee on dongur, sathee, and rubbee, and the rest jinuswar...	6	..	..	..	..	..	6
Bhagbuttaee and plough tax and beegotee on a few lands...	2	..	2
Bhagbuttaee and khata veera	3	..	3
Fixed amount on plough and on rubbee, one-seventh share of wheat...	1	..	..	..	..	1
Bhagbuttaee with babtees...	1	..	..	1
Bhagbuttaee and hull veera...	5	..	..	5
Bhagbuttaee, the produce of which belongs to the Marwarce State, and the veera only belongs to Government...	2	..	..	2
Total...	45	122	77	90	126	10	4	474

The following is an extract of a letter from the Collector of Ahmedabad to the Revenue Commissioner, No. 199, dated 3rd July 1848 :—

“3. The bhagbuttaee principle, which is the most objectionable of all, not only in the point of inconvenience to Government in receiving grain, &c. in kind, and having to dispose of it, but in the method in which the amount of the share is determined, in which there is so much matter of conjecture and opinion, that there is almost always room for suspicion of unfairness, which can rarely be brought home. This system occasions loss to both Government and the ryots, and should be got rid of with all speed; and my directions to the Mamludars have been to take in hand bhagbuttaee villages first.

“4. The jinuswar system, or assessment by crops, is also highly objectionable, from the great number of crops upon which different rates obtain, and also from there being a further assessment on second or third crops taken from the land in the same year, all which occasion a great deal of interference with the cultivator, by the necessity of investigations by the Native Local Officers.

“5. The khatabundee system would appear to imply a leasehold system, but this is not exactly its nature. The person who takes a khata undertakes to cultivate a number of beegas at a certain rate, so many more at a lower rate, and any more at a further lower rate; but some ryots are assessed at half a khata, when they are thought to be unable to undertake a whole khata, and are allowed to cultivate only half the number of beegas at the higher rate, and so on. The question who is to be admitted to cultivate a half khata rests with the Patel, and amounts to assessment upon means which require to be inquired into in cases where half khatas are admitted, besides the inquiry into the actual state and extent of cultivation.

“6. The hull veera system is a tax in the lump, upon as much land as a person can cultivate with a plough and one yoke of oxen. The amount varies very much, and whether he is to pay for one or two, or half a plough, is determined according to means, or according to the number of cattle the person has.

“7. There are also beegotees for the year, and fixed assessments on irrigable fields.

“8. The systems in themselves are intricate, but when they come to be mixed with others, they become so complex as occasionally to render the question what should be the assessment in a particular case a very difficult problem. In some villages so many as four different kinds of assessment prevail, and most others have some mixture of system, besides conditions as to the enjoyment of alienated land, and different rates existing for different classes of cultivators, all which render assessment questions exceedingly complex.”

Mode of making the Cultur, or Appraising of Crop in Bhagbuttaee Villages in the Ahmedabad Districts, according to the account given by Goolabroy, Desae of Duskrohie Purgunna.

When an Ameen or Tusweesdar examines, or other officers go to a village, they collect all the Mutadar (Patels in office) and the Culturoo (appraisers), one or two practical Patel cultivators, and such others as can be depended upon not to show favour, and, in company with the Tulatee (village accountant), proceed to one of the divisions of the lands of the village, previously giving notice to the cultivators of that division to be present at their fields, and they commence operations. First of all, the Tulatee's register of fields is referred to, and the state and kind of crop therein noted compared with the crop on the field, and the extent of cultivation is also examined, and if the whole of the field is sown with one crop, the Ameen or Tusweesdar notes it down on a separate piece of paper, and in some cases in a separate book, which is called dhal-na-chopra, (book of appraisement); thus the Tusweesdar takes a general view of the standing crop, and the rest of the party proceed to determine from appearance the probable out-turn of grain by maund. The occupant of the field is then informed of the result of the appraisement: if he has any objections to offer, the manner of the appraisement is explained, and sometimes a small abatement is made, but if they are still dissatisfied a chokee (guard) is placed on the fields, and the actual out-turn determined on the field when the crop is reaped: but if the cultivator agree to the appraisement, a memorandum is given to him of the quantity appraised, for his satisfaction.

After the villages are appraised by the Ameen or Desaees, they report to the Mamlutdar the result of their inquiries, and send him a copy of the appraisement, when the Mamlutdar goes out himself, or sends out a Karkoon, compares the notes with the field, and the crop appraised, and if there be any doubt in his mind as to the quantity appraised, he makes an alteration in the presence of the cultivators, increasing or decreasing the quantity, from the appearance of the crop or field; the Mamlutdar's or Karkoon's examination is considered final, and the Tulatee is then ordered to take the necessary security from the cultivators for the payment of the rent, and allow them to remove the crop. The quantity of grain due to Government is left with the cultivator on his paying the value according to the market, but if the cultivator declines to keep the grain himself, it is sold, but until the sale takes place the grain remains under care of the cultivator, who is unanswerable for its production when required.

LABOUR EMPLOYED, AND ITS REMUNERATION.

The following extract from the Revenue Survey Report on the Duskrohie Purgunna, dated 30th September 1825, by Captain James Cruikshank, Revenue Surveyor, gives the out-turn on a beega of land sown with bajree and kuthol (pulse crop), which is the common produce of the country:—

	<i>Rs. a. p.</i>
"Manure, 10 carts every second and third years, say equal to 4 carts annually.....	1 0 0
Ploughing	2 0 0
Seed, 5 seers of bajree and 3 of kuthol or pulse	0 4 0
Weeding.....	1 4 0
Reaping and threshing.....	2 0 0
	<hr/>
Beegotee or rent, varying from Rs. 3 to 5½ per beega, say....	6 8 0
	3 12 0
	<hr/>
Total.....	10 4 0

"Produce in bajree and kuthol from 10 to 20 maunds, say 16 maunds, at 1½ maund per rupee.....	10 10 0
Kurbee (200 bundles of straw) and gotar, (remains of the threshing of the pulse or kuthol).....	1 8 0
	<hr/>
	12 2 0

Balance remaining.....Rs. 1 14 0

"The above is for uwul land : for the doyum soil the expense is Rs. 8-8-0, and produce Rs. 10-12-0, leaving a balance of Rs. 2-4-0 ; and for the soyum soil the expense is Rs. 5, and the produce is Rs. 6-14-0, leaving a balance of Rs. 1-14-0.

"The kurbee or straw of the doyum and soyum soil yields a better return than that in the uwul."

The ordinary rates of hire to common labourers employed in building at Ahmedabad are as follows, according to the city Foujdar's return :—

Labourers per diem: able-bodied 2½ annas ; ordinary 2 annas ; women 2 annas ; boys 1½ anna.

The workmen at the paper manufactory receive higher wages, and from inquiries made at the manufactory, I am informed that upwards of 800 men and boys are employed there daily.

The following is the nerrick or rate of hire for carrying burdens, carts with two and four bullocks, pack bullocks, and camels, &c. per coss, as obtained from the office of the Foujdar of the city of Ahmedabad :—

	<i>Rs. a. p.</i>
Hire of one cart with one pair of bullocks, per coss	0 2 8
Ditto ditto two pairs of bullocks, per coss	0 4 0
Palanquin bearers carrying a passenger, each bearer per coss ..	0 1 4
Ditto carrying an empty palanquin, per coss per man.	0 0 8
Bullocks on hire for a dumnee or travelling cart, per diem, whether with passenger or empty, per coss	0 2 8

	<i>Rs. a. p.</i>
Camels when carrying burden, per coss each	0 1 6½
Ditto empty, not customary to charge anything ..	.....
Man's load not stipulated, but paid according to agreement in the city. The biggarces on the road, carrying baggage of travellers from one village to another, are paid six pies per load per coss	0 0 6

[NOTE.—A coss in Guzerat is equal to 1½ English miles.]

NAVIGABLE RIVERS.

There is no navigable river under this Collectorate, unless the Dholera and the Bhownuggur creeks may be considered such. The former is navigable for Native crafts, commonly known as botella and prow. The Saburmuttee river, which runs though the greatest part of this Collectorate, is difficult of entrance at the mouth, from the number of sand-banks, and is without a convenient harbour. An attempt was once made to establish a bunder at Motee Boroo, the southern village of the Dholka purgunna, but failed from natural difficulties.

The Bhownuggur river is navigable for the Native craft five miles, to within one mile of the town of Bhownuggur, and even vessels of 400 tons may proceed as far as the creek commonly known by the name of Sanghae. The steamer *Carnac* went up this creek this year (1847) up to the great kharee, called Kankrakharee, about a mile and a half from the town, where sufficient water remains to keep the vessel afloat even at low water.

The Gogo bunder has a very small creek, in which no water remains when the tide is out, and large vessels ride at anchor about a quarter of a mile off the bunder. Botellas, &c. enter the creek during the tide to load, and sometimes they remain, and are high and dry during the low tide.

There is no good shelter for vessels in bad weather between Gogo and Bombay, so that it not unfrequently happens, particularly in the month of May, that boats which have nearly accomplished the voyage to Bombay are obliged to return the whole distance to Gogo in case of meeting bad weather. The roadstead at Gogo is well sheltered from the southerly winds by the island of Perim, between which and the mainland on the Gogo side are several reefs of rocks, which effectually break the swell of the sea. From the proximity of land, and a large sand-bank, there is no fear in case of northerly or other winds. During the months of March and April it appears to me that the harbour of Gogo might be made available for ships sailing direct to England. A cargo of cotton and wheat might be obtained there, and all the expense of transhipment to Bombay avoided. Cotton screws were erected at Gogo by the late Hutteesing, a merchant of Ahmedabad, but they are not used, owing, as it is understood, to the influence of some merchants in Bombay.

DESCRIPTION OF NAVIGABLE RIVERS.

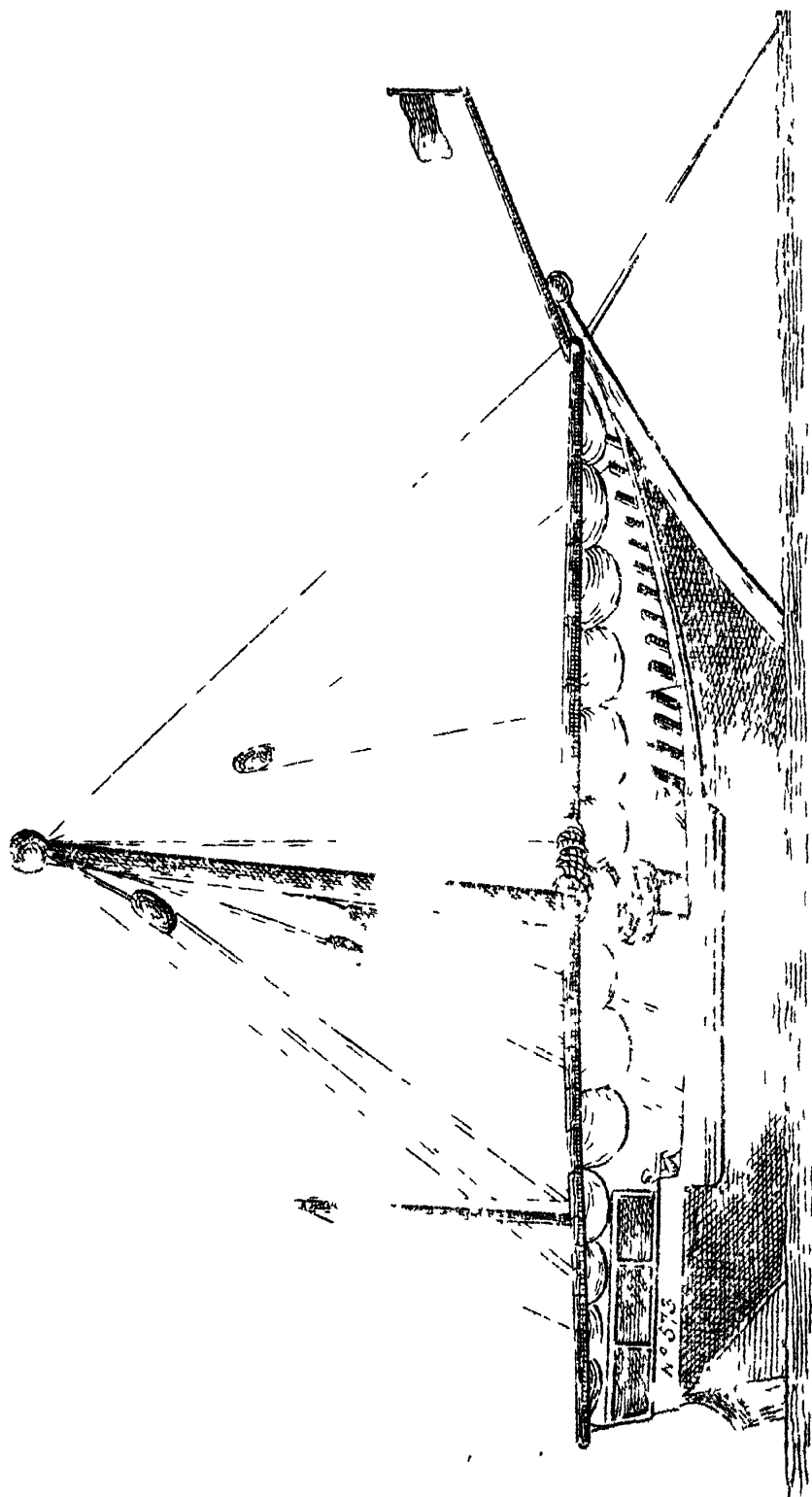
The Dholera creek was navigable for country boats of 200 to 300 candies for $7\frac{1}{2}$ miles, as far as the Gobra bunder, which is $6\frac{1}{2}$ miles from the town of Dholera ; but, in A. D. 1817 the Bhadur river burst its bank, and the stream from it, which served to keep the Dholera creek deep, being directed into the Bhogawa, tended to choke up the Dholera creek, so that it was abandoned, and goods were mostly shipped at the bunder of Bhowleearee, which is situated 16 miles to the south of Dholera, on a creek navigable about 7 miles from the Gulf. Another port was opened at Amlee in 1836, 8 miles north-east of Dholera, but has been abandoned since February 1846, when the encroachment of the sea and the filling up of the creek rendered it useless.

In the year 1844-45 the Bhadur river reverted to its original channel, but instead of taking its original course along the old creek near Gobra, the water forced another channel near the village of Khoon, about $4\frac{1}{2}$ miles from Dholera, and formed a very commodious harbour for vessels (the Gulf of Cambay being about 6 miles from the usual anchoring ground) for discharging and receiving cargo. The navigation, however, outside in the Gulf is confined, and vessels are unwillingly taken there, without a probability of a fair wind or fine weather. The Khoon bunder was opened in February 1846.

LENGTH OF RIVERS.

Particulars regarding Rivers and Creeks in the Ahmedabad Collectorate, showing their Names, and how far they are navigable, &c.; principally derived from the Map of Guzerat by the late Lieutenant Colonel MONIER WILLIAMS.

Names of Rivers and Creeks.	Places near which they rise	Falling into another River, or Sea, near what Place	General Direction	Length of Course in Miles	How far Navigable in Miles	Navigable to what Place	Remarks.
Sabarmuttee	Unknown	Gulf of Cambay	South . . .			....	The length of course is said to be 200 miles, but this is not certainly known.
Hautmuttee	From the mountains on the confines of Guzerat and Mewar, 8 miles east of Paull	Near Waghpoor, joins the Sabarmuttee River	South-west	78	..		
Watruk	Near Bhundah, south of Doongurpoor	Joins the Sabarmuttee	South-west	151	..		
Meswa	Rises near Mutia Mulla, south-west of Doongurpoor	Joins the Watruk 5 miles north of Kara	South-west	126	.		
Majum	Near the village of Mutia Mulla, south-west of Doongurpoor	Joins the Watruk near Powlee.	South-west	66	..		
Kharee	At Vinjlotka Muth, near Ahmednuggur, north-east of Puranteje	Joins the Sabarmuttee at Ruskipoora, Dholka Purgunna	South-west	105	..	....	Distance from actual survey
Bhagawa	5 miles south-west of Chotela, near Kurwa, Rajcote Agency	Falls into the mouth of the Sabarmuttee	East	82	..		
Bhadur	4 miles south-west of Amundpoor, Rajcote Agency	Gulf of Cambay	East	94	6	Khoon Bunder .	The Goona river joins the Bhadur
Bhownuggur	Near Bokera, north-east of Jhusdun, Rajcote Agency	Gulf of Cambay	East	66	5	Near Bhownuggur	Several tributary streams fall into the Bhownuggur creek.
Kaloondur	Near Bhundareea, Gogo	Purgunna Gulf of Cambay	East	15		Bhowlearee Bunder, near Mandvepoora	The Neelkee and Ootowlee rivers fall into the Bhowlearee creek.
Bhowlearee	Near Buddawree, of the Agency, and about 4 miles south of Pallad.	Raycote Gulf of Cambay	East	39			Several streams, named the Kochleea, Parleea, and Keyree, fall into the Soondrye creek
Soondrye Creek	6 miles west of Tooka, dooka Purgunna	Gulf of Cambay	East	35	6	Goondala, village belonging to the Thakore of Bhownuggur	



A Botella, 1500 tonnes

The rate is subject to fluctuation, according to the demand for freightage. In the month of May, when cotton is shipped to Bombay in large quantity, a strong south-west wind prevails, and then the wages are raised to Rs. 5 and even Rs. 8 each kalasee. A botella of 100 candies carries ten men, including the tindal.

A prow of 50 candies carries seven men ; a prow of 25 candies carries four men ; a prow from 10 to 13 candies carries three men. The two last small crafts seldom go to Bombay, as the trip does not cover the expense ; therefore only large vessels are freighted for Bombay.

The ordinary freightage is paid by merchants at 12 annas per candy, which equals 10 Indian maunds, from the opening of the season to March, and from April freight rises to Rs. 2 per candy.

The rates of passage money per head paid by the ordinary or lower sorts of passengers are as follows :—

	<i>Rs. a. p.</i>
From Gogo to Bombay.....	1 0 0
„ to Surat	0 10 0
„ to Broach	0 10 0
„ to Tankaria	0 10 0
„ to Cambay.....	1 0 0
„ to Dholera.....	0 8 0
„ to Bhownuggur.....	0 4 0
„ to Damaun.....	1 0 0
„ to Bassein	0 10 0

Freightage of opium and cotton is not reckoned per candy, but per box or bale. Opium shipped in a botella pays Rs. 2 per box, and sometimes Rs. 3 ; per steamer, Rs. 3 or more per box. Cotton bales weigh 6 Indian maunds each : the charge of freightage is Rs. 1 per bale, but it increases from 12 annas to Rs. 2 and sometimes Rs. 3 a bale. Instances have occurred of the freight rising to Rs. 6 a bale ; but this is very seldom, and depending on a very great demand for cotton. The cotton is brought here chiefly from the Jeetpoor, Dorajee, Babreeah, and Oomrellee districts of Kattywar. The Gogo purgunna does not produce very much.

LAKES.

Description and Situation.

The only sheet of water of large extent is the Null, which is situated to the south of the Veerumgaum purgunna, and to the west of the Dholka purgunna. The water is brackish, and there are innumerable little islands, which afford grazing to the herds of cattle which are taken there for the purpose during the hot weather. The following account of this remarkable lake is extracted from the Survey Remark Book on the Dholka and Veeramgaum purgunna, and from inquiries :—

“ The distance from Ahmedabad to the Null is 37 miles, near Doorgee Menee, SWW.

Extract from Revenue Survey Report of the Dholka purgunna, paragraph 6, dated 31st December 1825.

“ The western frontier of the purgunna touches upon a lake bearing the name of Null, which extends over a measured area of 3,1500 acres, or 49½ square miles, and of this 22,796 acres, or 35 square miles, were actually covered

with water at the time its outline was surveyed, in February 1824. In general character it is shallow, muddy, and abounding with thick impenetrable masses of reed, and is always covered with flights of water-fowls. It is bounded by no perceptible bank ; and the country that borders on it is a dreary desolate flat, covered with vegetation of the rankest and most unwholesome nature. On its eastern side there are some very remarkable undulations, which bear a remote similarity to the Mor Puna, or sandy hillocks that skirt the seashore between the Taptee and Nerbudda rivers. As soon as the rain ceases falling, the water becomes brackish, turning gradually more and more so, till perfectly salt. The shallow parts turn proportionally quicker than the deep, but the whole is salt by the end of February or March. Though at any time unfit for irrigation, it is never sufficiently impregnated to admit of the manufacture of salt itself, and it is the unanimous opinion of every person questioned on the subject, that in no part of it could salt-pans be constructed with the least prospect of success.

“The reeds are used for chuppers or thatched roofs of houses, and the roots are eaten under the name of beer. These roots are dug up carefully, separated from the fibres, and ground into flour. The bread has a dry, sweetish, and by no means unpleasant taste, something resembling ginger-bread : while grain is procurable, only the very poorest classes feed upon it, but during a season of famine, numbers are driven to it to support existence ; and in that of Sumwut 1869 (A. D. 1812-13) the place is said to have been thronged. To those accustomed to it from their birth it is nutritious enough, but when incautiously eaten in any quantity by persons used to more wholesome food, it is apt to bring on violent dysentery and inflammation of the bowels, often proving fatal.

“The fibres are supposed by the people to be a deadly poison. It is this reed alone that renders the ground occupied by the Null valuable, and an object of contention among the villagers that surround it. Mence and Doorgee, of the Dholka purgunna, have unsettled claims within it, which cannot be satisfactorily adjusted until the tract on the western side in the Veerungaum purgunna shall have been examined.”

There is another extensive sheet of water close by the kusba town of Puranteje, in a hollow called the Boke, a description of which is given in the “Transactions of the Bombay Geographical Society” from May 1844 to February 1846, by Captain Fulljames. There are several pieces of water in the Boke, forming a sort of chain of tanks ; the largest is about 2,090 yards long and 1,170 yards broad, and the general depth in the dry weather is about 12 feet.

CANALS.

There are no canals of any sort in this district. All inland traffic is carried on by carts, camels, bullocks, and asses ; which is explained under the head of “Modes of Transit and Communication by Land.”

From the nature of the soil, which is loose and friable, particularly the goraroo, also from the want of a large supply of water, and the great evaporation, I doubt the probability of constructing them so as to be of practical utility, even putting the subject of expense out of the question.

WELLS AND TANKS.

Wells and tanks seem to have been much encouraged in the districts under this Collectorate, numerous old tanks still existing throughout the country. Large tanks are to be met with in places far away from villages, and tradition attributes their erection to the Brinjarees of former times, who excavated them on the line of their march to water the hordes of cattle conveying salt into the interior of Malwa.

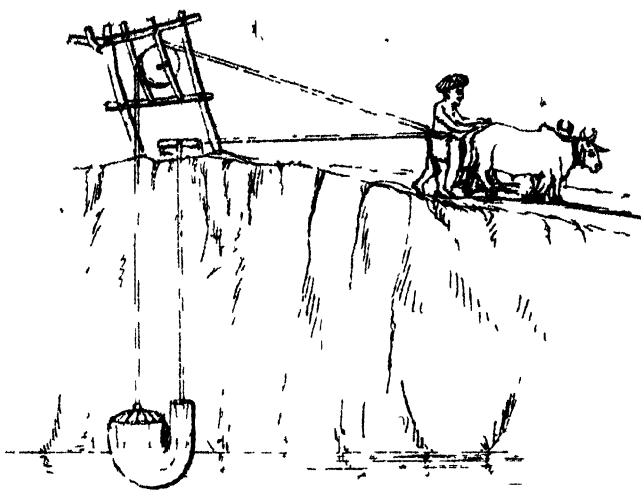
The erection of wells is a subject which has repeatedly drawn the attention of Government, and every encouragement has been held out to the ryots to build new ones, and also for the repair of old wells, by which means the evils of famine from droughts are ameliorated. Numerous wells are to be found in the bounds of almost every village, but a great number have fallen in. The interior works in many are found entire, and in years of famine many are reopened, and the lands in the neighbourhood irrigated. In the year 1846 the Bombay Government extended further encouragement to persons to sink wells, under condition of allowing the ryots the enjoyment of reaping the benefit arising from irrigation for a period of thirty years from the year in which the well is first commenced working, that is, the irrigation tax which prevails in all villages on lands irrigated is for that period exempted, and the lands are only charged the ordinary rates, that is rates in common with other lands on which the ordinary monsoon crops are raised.*

MEANS OF IRRIGATION IN EACH DISTRICT.

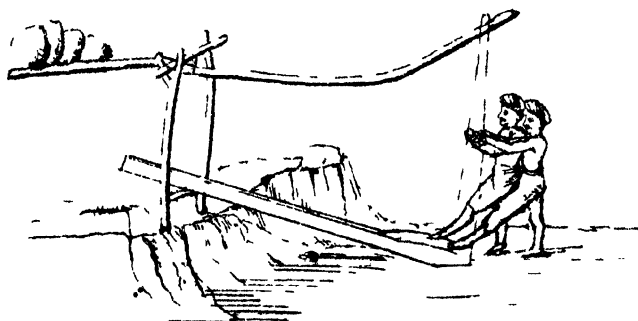
Irrigation is carried on to a considerable extent in the Duskrobie and Dholka purgunnas, in raising the superior crops of sugar-cane, plantains, &c. and in the other purgunnas for raising crops of wheat, barley, and cheena (an inferior sort of gram).

Wells are most generally in use for irrigation. The tank irrigation is almost confined to the early part of the season, for bringing the rice crops to maturity. The rivers Saburmuttee and Kharee afford many spots along their course where water can be raised by an arrangement called a dekoree, which is merely a rude frame over the bank of the river, on which the water-bag is worked. The lands in the neighbourhood of the lower part of the course of the Kharee being low, water can be taken to them by watercourse, but in some places it is necessary to raise the water a little by an arrangement called a jeela.

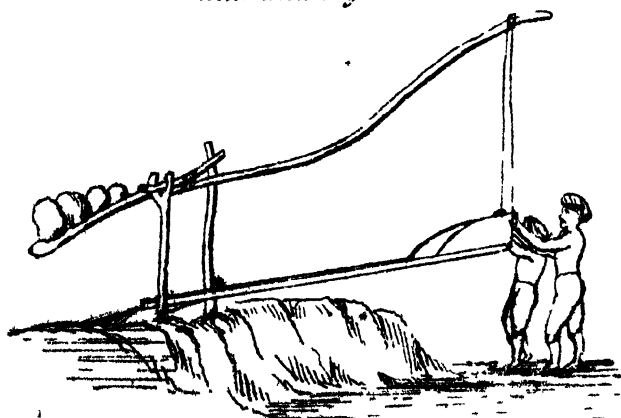
The water-bag used in wells and dekorees is of two kinds, one being merely a leather bag with an iron hoop to keep the mouth open, and requires to be upset when it arrives at the top of the wells, and is called *ramea koss*. The other has a long tail, open at the end, and doubled up while drawing; but on



The Spondeea Koss



*The Jelu in the act of being filled
and discharged*



arrival at the top a small rope pulls it forward, and the water comes out of itself: this is called the *soonleea koss*.

HARBOURS, AND SHIPPING FREQUENTING THEM.

There is but one place which comes under the denomination of a harbour, viz. Gogo; the other resorts of vessels are in creeks some short distances inland.

The harbour of Gogo affords good anchorage, the holding ground being good; and the locality is protected from southerly winds by the island of Perim, and the reefs extending to the shore on that side of the Gulf. It is protected from northerly winds by sand-banks in that direction, and the shore is not dangerous, being soft ground, and very strong easterly winds not often occurring.

The whole of the Gulf of Cambay has undergone survey by officers of the Indian Navy, to which reference can be had for particulars. With the exceptions of a few coasting steamers, viz. the *Carnac*, *Phlox*, *Surat*, and *Dwarka*, the vessels which resort here, the trade is carried on by the usual country crafts, botellas, prows, &c.

The harbour of Gogo has the advantage of a light-house, of which the following is a description:—

Perim Light-House.

This light-house is situated on the island of Perim, under the Gogo mahal, Ahmedabad Collectorate. It was erected by Government in A. D. 1832, at the joint suggestion of Mr. H. Borradaile, then Collector of Customs at Surat, and of Commodore G. Grant, of the Indian Navy.

Commodore G. Grant, in a letter to Sir Charles Malcolm, Superintendent of Marine, Bombay, dated 26th January 1830, suggested the utility of having a light-house built on Perim island. The following observations by the Commodore on the dangers surrounding the island are given in his own words:—

“The island is directly in the way of vessels proceeding to and from the ports of Gogo, Bhownuggur, Bhowlearee, and Dholera. It bears from the north point of Broach WSW½W., distance about 13 miles; and from the western shore it is distant about 4 miles. From Gogo it bears SE., and distant about 8 miles. Dangerous reefs of rocks surround it, and both the ebb and flood tide set very strong in between it and the mainland. It is consequently of the utmost importance that vessels should keep out of their influence, as they sweep them amongst the dangerous shoals lying between the island and the main. Many vessels with their crews have been totally lost by getting on shore near Perim in the night; consequently they generally keep along the east side of the Gulf, to avoid the danger, during the months of April and May. This cannot always be done, as when the southerly winds prevail, the swell is so great on the eastern shore as to render it very often unsafe to anchor: the

consequence is that they are obliged to run for Gogo, at the risk of the lives of every person on board; whereas, if there was a light-house on the island, it would be as safe to stand on at night as it would be by day. The light on Perim would be of the greatest advantage to vessels on the eastern shore, being a cross-bearing to guide them to the anchorage off the port they might be steering for. Besides, in very bad weather, when it might be dangerous to anchor, they could run to Gogo road in perfect safety. It appears to me that a small light-house might be erected on the ruins of an old tower now standing on the highest and most conspicuous part of the above island, at a small expense. The platform of the tower is near 50 feet above high-water mark. Plenty of stones in the neighbourhood, from the ruins of an old fort close to the tower."

The above suggestion was recommended to Government by Sir Charles Malcolm, the opinion of the Collector of Sea Customs, Mr. Borradaile, thereon being favourable. He proposed 8 annas for every boat as a light-house fee for the maintenance of the establishment on the island. An assurance, however, is recommended to be given to the trade, that when the whole outlay of the light-house has been covered, further exaction of the tax would be discontinued, or proportionally reduced. The establishment was at first placed under the control of the Commodore at Surat, and the syrang of the light allowed Rs. 8 per month for a boat. At present the establishment is under the Collector of Sea Customs. The establishments for the Perim light-house are a gunner, syrang, and seven lascars, at a monthly expense of Rs. 156. This continued till 1841, when the establishment was reduced to Rs. 57½ per mensem. The present establishment stands thus per month:—

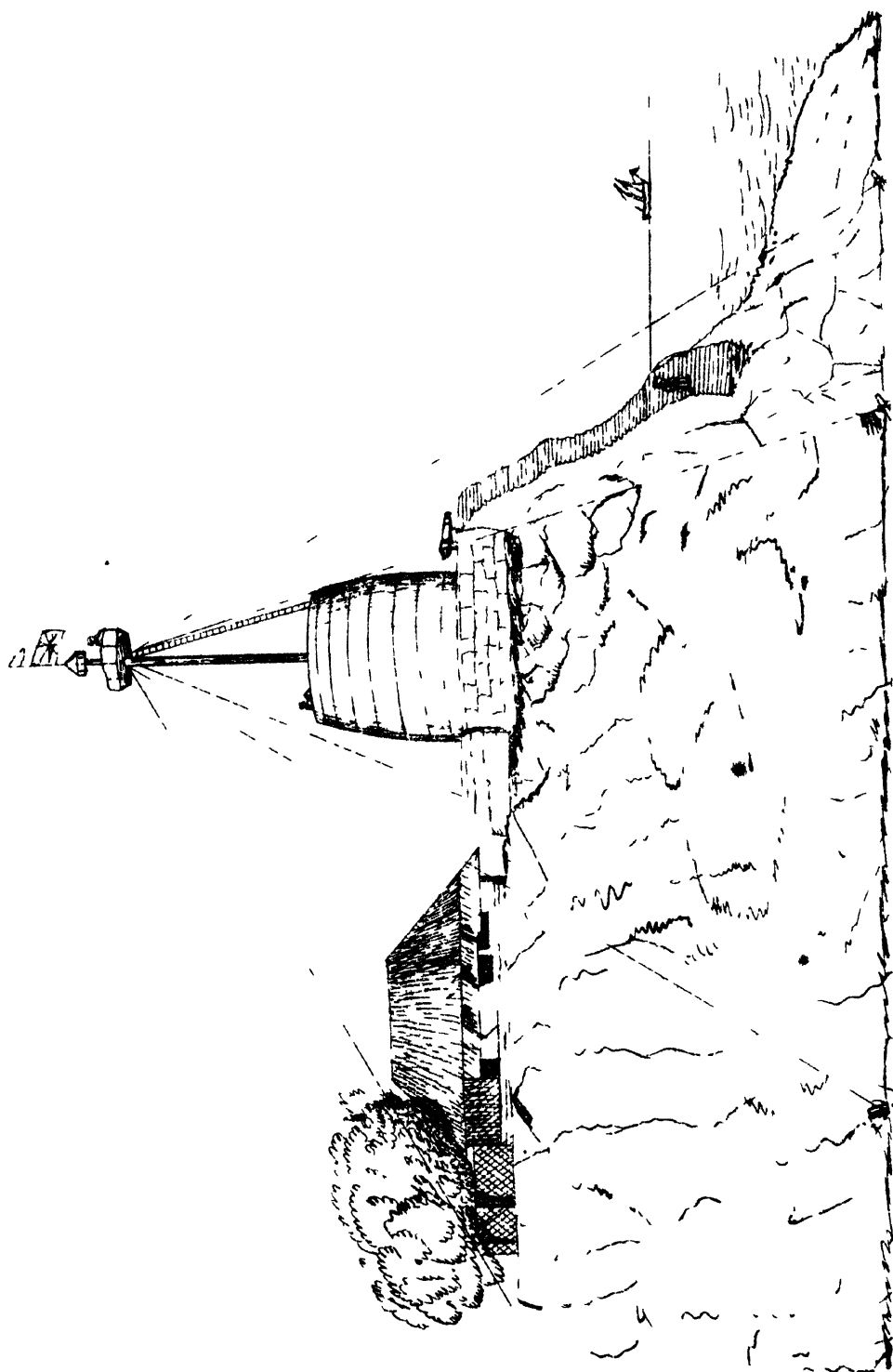
Syrang	Rs. 16	4	0
Tindal	8	8	0
Five kalasees, at Rs. 5	25	0	0
Hire of a boat	8	0	0
	<hr/>	<hr/>	<hr/>
	57	12	0

The island of Perim belongs to Kusbatees of Gogo, named Mosumbhaee and Zacoobjee, to whose forefather it was granted in free gift by the King of Delhi, under whose seal they enjoy it to the present day, free of rent.

The appearance of the light-house is given in the accompanying sketch, taken on the north-west side of it.

The amount of fees collected for the last five years is as follows, as obtained from the Custom House at Gogo:—

1842-43	Rs. 493
1843-44	561
1844-45	544
1845-46	522
1846-47	550



The island of Perim has obtained some notoriety from the number of fossil bones found there: some I have seen are of animals of very large size, probably the mastadon; there are also bones of animals still extant, and common; for instance those of hogs, alligators, camels, and turtle. The place where these curiosities are found is far below high-water mark, on the reef at the south side of the island. The place is approachable only at low water.

The village on the island consists merely of a few huts for twelve families, who cultivate about 100 beegas with bajree, tull, &c. In the hot weather, they generally leave the island, and live in Gogo till the season for cultivation arrives. Good stones for grinding grain are found here, and the proprietors receive Rs. 5 per 100 from the people who dig them out. On the coast opposite, in the neighbourhood of Gogo, are found red ochre and Fuller's earth.

CITIES, TOWNS AND VILLAGES.

The following statement gives an alphabetical list, by purgunnas, of all the villages in the Collectorate, with particulars relating to their size, value, and tenure, &c. :—

DUSKROHIE AHMEDABAD.

No.	Names of Villages.	Total Area.	Male Population 1st January 1848.	Number of Houses 1st January 1848.	Direct Distance from Ahmedabad.	Shops.	Revenue in 1846-47.	Tenure.
		Acres.	Census of 1846.		Miles.		<i>Rs. a. p.</i>	
	City of Ahmedabad ..	1,346	45,723	32,221	.....	2,874	.....	Khalsa.
1	Aspoor ..	74	..	..	2½ NE.	..	210 0 0	"
2	Baghfurdos ..	1,082	170	89	3½ SW.	..	1,908 0 0	"
3	Bahadurabad ..	460	108	68	7½ ESE.	..	681 0 0	"
4	Bakrol Boojrug.	2,023	547	260	10½ SSE.	5	2,315 0 0	"
5	Butwa ..	3,965	1,647	849	5½ SE.	34	7,622 0 0	Inamtee.
6	Beeheepoor ..	673	69	30	7½ SE.	1	499 0 0	Khalsa.
7	Beherampoor ..	1,236	7	2	1½ SSW.	..	2,507 0 0	"
8	Bharej ..	2,025	315	163	7½ WNW.	2	2,831 0 0	"
9	Bhat ..	1,569	194	115	5½ NNE.	21	3,396 0 0	"
10	Bhoowalree ..	2,109	928	427	9 E.	20	2,584 0 0	"
11	Boorthul ..	1,330	306	142	8½ NNE.	..	21,656 0 0	"
12	Borukdeo ..	1,303	178	94	4½ WNW.	..	1,887 0 0	"
13	Chandecul ..	1,766	256	118	15½ E.	1	1,253 0 0	"
14	Chandloreca ..	1,018	231	106	4 NNW.	1	1,754 0 0	"
15	Chandkhara ..	2,561	250	253	6¼ N.	6	1,066 0 0	"
16	Charoree ..	704	89	65	7 NNW.	..	461 0 0	"
17	Checlora ..	1,209	215	111	7 NNE.	2	1,309 0 0	"
18	Chanpoor Khan-dee ..	499	113	59	5½ NNE.	1	1,021 0 0	"
19	Chudawur ..	580	119	77	½ W.	1	1,219 0 0	"
20	Chotee Duskroie.	Not surveyed; consists of waste spots in the city.				..	167 0 0	"
21	Chungejpoor, or Meetakullee ..	345	164	97	½ WNW.	1	908 0 0	"
22	Dholukooa ..	512	151	40	12 NNE.	..	32 0 0	"
23	Duntatee (Sertha) ..	1,013	228	116	11 NNW.	..	1,197 0 0	"
24	Durecapoor ..	563	281	252	½ N.	103	1,294 0 0	"
25	Fendrorra ..	2,210	428	218	13½ NNE.	..	1,463 0 0	"
26	Ehanasun ..	1,170	286	235	9½ NE.	3	2,005 0 0	"
27	Eesunpoor ..	1,169	271	168	3 SSE.	1	1,087 8 0	"
28	Fureedabad ..	48	..	..	¼ E.	..	77 0 0	"
29	Futepoor ..	59	49	35	18 SW.	..	169 0 0	"
30	Futwarce ..	2,373	155	69	6 SW.	..	1,968 0 0	"
31	Geeaspoor ..	2,061	248	158	6½ SSW.	1	1,268 0 0	"
32	Gerutnuggur, or Ruleeatpoora ..	774	54	29	7¾ SE.	..	820 0 0	"
33	Gerutpoor ..	596	176	93	8½ SSE.	..	1,888 0 0	"
34	Ghantloreca ..	1,121	123	73	3¾ NW.	..	1,254 0 0	"
35	Gota ..	1,515	249	173	5½ NNW.	3	1,923 0 0	"
36	Ghorasur ..	1,257	74	43	3½ SSE.	..	1,321 0 0	"
37	Gutrar ..	3,382	802	424	8½ ESE.	13	4,170 0 0	"
38	Hansol ..	2,110	135	89	5 NNE.	2	2,016 0 0	"

No.	Names of Villages.	Total Area.	Male Population 1st January 1848.	Number of Houses 1st January 1848.	Direct Distance from Ahmedabad.	Shops.	Revenue in 1846-47.	Tenure.
		Acres.	Census of 1840.		Miles.		Rs. a. p.	
39	Heehutpoor ..	704	192	111	6 WNW.	2	852 0 0	Khalsa.
40	Heerpoorkhoord.	46	..	..	1 SE.	..	74 0 0	"
41	Hooka ..	635	117	75	10½ NNE.	..	573 0 0	"
42	Hanspoor ..	775	88	46	7½ ENE.	2	596 0 0	"
43	Janoo ..	2,650	560	282	10½ E.	2	2,414 0 0	"
44	Jhoondal ..	1,670	420	187	7½ N.	5	2,765 0 0	"
45	Jehangeerpoo, or Jamulpoor ..	203	122	55	2 NE.	1	156 0 0	"
46	Jugutpoor ..	888	113	67	6 NNW.	..	729 0 0	"
47	Jumecatpoor ..	919	380	209	10 NNW.	2	1,105 0 0	"
48	Kajecpoor, or Badeepoor ..	773	..	..	1 N.	..	1,533 0 0	"
49	Kalee ..	935	434	241	4½ N.	1	1,900 0 0	"
50	Khoreera ..	1,014	257	156	8½ NNW.	1	1,486 0 0	"
51	Khoruj. ..	1,936	445	250	8½ NNW.	2	2,976 0 0	"
52	Kolia ..	1,781	381	156	9 NNE.	3	1,063 0 0	"
53	Kochrub ..	697	448	277	1 SW.	5	1,695 0 0	"
54	Koobuthul ..	2,373	818	350	11½ E.	17	3,483 0 0	"
55	Kooha ..	4,935	1,342	698	14 E.	20	5,970 0 0	"
56	Kolurpoor ..	616	26	24	6 NNE.	..	417 0 0	"
57	Kumbha ..	1,637	712	185	9½ E.	9	2,923 0 0	"
58	Kurhee. ..	1,150	61	31	9 NNE.	..	748 0 0	"
59	Kojar ..	2,315	506	271	9½ E.	3	18 9 11	Inamee.
60	Kotesur ..	592	70	36	5 NNE.	1	Free.	Dewusthan.
61	Kudunpoor, or Chotee Duskrohie ..	28	..	..	½ S.	..	16 0 0	Khalsa.
62	Lalpoor ..	520	111	61	11½ E.	..	555 0 0	"
63	Leclapoor ..	961	147	69	9½ NNW.	..	704 0 0	"
64	Leemreca ..	860	95	51	9½ NNE.	1	857 0 0	"
65	Lulikamun ..	1,283	260	129	8½ NW.	1	1,149 0 0	"
66	Medura. ..	1,152	275	117	10 NE.	1	1,764 0 0	"
67	Mehemudabad Kokra ..	836	265	151	3 SE.	..	1,852 0 0	"
68	Mehemudnuggur ..	538	105	61	3 WNW.	..	946 0 0	"
69	Mehemudpoor ..	776	133	76	5½ W.	..	762 0 0	"
70	Multanpoor ..	108	..	..	1½ N.	..	200 0 0	"
71	Moothecha ..	1,057	170	81	8 NE.	2	1,415 0 0	"
72	Motera. ..	1,295	297	167	4½ NNE.	4	2,002 0 0	"
73	Mukurlha, and 1 poor. ..	2,772	350	180	5 WSW.	..	4,602 0 0	"
74	Mukdunpoor ..	329	62	34	2½ SW.	..	37 3 11	Inamee.
75	Meetcepoor ..	249	..	..	2½ SW.	..	Free.	"
76	Nudeecha, or Suwad ..	89	..	..	1½ SW.	..	302 0 0	Khalsa.
77	Nuderat, Joonec Duskrohie ..	152	..	..	Bed of the river.	..	32 0 0	"

No.	Names of Villages.	Total Area.	Male Population 1st January 1848.	Number of Houses 1st January 1848.	Direct Distance from Ahmedabad.	Shops.	Revenue in 1846-47.	Tenure.
		Acres.	Census of 1848.		Miles.		Rs. a. p.	
78	Nuderat ..	152	..	..	Bed of the river.	..	329 0 0	Khalsa.
79	Nugeena ..	316	..	..	2 SE.	..	585 0 0	"
80	Nurora ..	3,732	1,202	603	5 $\frac{3}{4}$ NE.	28	5,360 0 0	"
81	Neekole ..	2,531	571	280	5 $\frac{1}{2}$ E.	14	107 1 3	Inancee.
82	Nalal ..	1,315	106	59	4 $\frac{1}{4}$ S.	..	28 13 11	"
83	Oosmanpoor ..	281	63	37	1 $\frac{1}{4}$ NNW.	..	614 0 0	Khalsa.
84	Oosmanbad ..	311	188	112	12 $\frac{1}{2}$ NW.	2	318 0 0	"
85	Oomarsud ..	4,370	1,424	766	12 $\frac{1}{2}$ N.	21	4,717 0 0	"
86	Okaf ..	921	..	..	5 $\frac{3}{4}$ SW.	..	77 4 6	Dewusthan.
87	Odhu ..	2,362	421	209	5 $\frac{1}{2}$ E.	3	3,242 0 0	Khalsa.
88	Oganej ..	3,641	749	316	7 $\frac{1}{2}$ NW.	25	Free.	"
89	Palree Kochrub.	860	319	199	1 SW.	2	1,983 0 0	Khalsa.
90	Peeplo ..	1,376	194	96	5 $\frac{1}{2}$ SSW.	2	622 0 0	"
91	Por, or Mooza- frabad ..	1,460	480	259	9 $\frac{3}{4}$ N.	3	2,621 0 0	"
92	Purdol ..	1,267	508	180	10 $\frac{1}{4}$ ENE.	7	1,973 0 0	"
93	Pusoonj ..	2,776	194	276	14 $\frac{1}{4}$ E.	8	3,309 0 0	"
94	Raipoor ..	1,527	568	323	11 NE.	28	2,130 0 0	"
95	Raisun ..	868	227	101	11 NNE.	4	1,128 0 0	"
96	Rajpoor, 2 Utee	89	..	..	2 E.	..	269 0 0	"
97	Rajpoor Heer- poor ..	1,255	515	310	1 $\frac{1}{2}$ SE.	4	2,760 0 0	"
98	Ramd ..	2,051	483	323	6 SE.	7	3,148 0 0	"
99	Raneep ..	1,354	179	109	3 $\frac{1}{2}$ N.	..	2,171 0 0	"
100	Rukheal Booj- rug ..	627	95	53	2 $\frac{1}{2}$ E.	..	1,211 0 0	"
101	Rukhealhkoord.	156	..	..	2 $\frac{1}{2}$ E.	..	500 0 0	"
102	Rukheal Turff.	1,152	175	88	2 $\frac{1}{2}$ E.	4	3,851 0 0	"
103	Sanoda ..	2,524	891	478	19 $\frac{3}{4}$ NE.	29	2,126 0 0	"
104	Seengurwa ..	926	190	112	7 E.	3	1,446 0 0	"
105	Shahbazpoor ..	990	179	110	12 NNW.	7	945 0 0	"
106	Shahwarce ..	2,995	289	165	3 $\frac{1}{4}$ SSW.	4	2,961 0 0	"
107	Sheher Kotra ..	653	Under the city of Ahmedabad. The people live in the city.		1 $\frac{1}{2}$ E.	..	2,428 0 0	"
108	ShekhpoorKhan- poor, or Nour- rungpoor ..	915	148	94	1 NW.	..	2,428 0 0	"
109	Sooghur ..	1,069	193	106	7 $\frac{1}{4}$ NNE.	3	1,331 0 0	"
110	Soorpoor ..	105	..	..	2 $\frac{1}{2}$ NE.	..	205 0 0	"
111	Soodul Khandrol, or Daneelumra.	1,234	130	84	2 S.	1	2,793 0 0	"
112	Sola ..	2,357	543	330	5 $\frac{1}{2}$ NW.	3	1,523 0 0	"
113	Sunadhal ..	4,008	336	227	8 SW.	2	5,365 0 0	"
114	Surkhej ..	1,667	2,135	1,324	5 $\frac{3}{4}$ SW.	46	2,780 0 0	"
115	Sumeeppoor ..	111	..	..	2 $\frac{1}{4}$ SE.	..	217 0 0	"
116	Syudpoor ..	1,278	422	192	4 $\frac{1}{4}$ NE.	5	2 12 8	Inancee.

No.	Names of Villages.	Total Area.	Male Population 1st January 1848.	Number of Houses 1st January 1848.	Direct Distance from Ahmedabad.	Shops.	Revenue 1846-47.	Tenure.
		Acres.	Census of 1848.		Miles.		Rs. a. p.	
117	Shabee Bagh .	418	..	..	1½ N.	..	1,208 0 0	Khalsa.
118	Tarapoor ..	907	137	77	11 N.	1	836 0 0	"
119	Thullej .	2,233	568	348	4½ NNW.	6	2,350 0 0	"
120	Tragur ..	918	206	123	7 NNW.	4	1,338 0 0	"
121	Ucher ..	1,074	193	89	4 NNE.	1	1,417 0 0	"
122	Udaluj ..	4,527	628	355	9½ N.	16	5,436 0 0	"
123	Ujabeebeena Kotran .	21	.	..	1½ NE.	.	125 0 0	"
124	Umetapoor	487	105	35	7 NNE.	..	770 0 0	"
125	Usarwa & 1 Poora, Hureepoor ..	2,450	429	233	2 NE.	4	5,598 0 0	"
126	Vesujhol .	2,625	317	187	6½ SE.	1	2,875 0 0	"
127	Vehelal .	1,994	1,006	504	12 ENE.	42	4,129 0 0	"
128	Vulad, with 3 Pooras	3,872	1,083	646	10½ NNE.	68	3,080 0 0	"
129	Warej .	2,534	312	185	5 N.	5	3,080 0 0	"
130	Wurod .	1,944	251	129	14 ESE.	.	1,203 0 0	"
131	Wustral ..	2,861	210	125	6½ ESE.	..	2,291 0 0	Inamee.
132	Wunjar ..	1,205	190	114	6½ SW.	2	2,517 0 0	Khalsa.
133	Wustrapoor ..	1,068	83	65	3 NNW.	1	1,290 0 0	"
134	Wasna .	934	267	126	2½ SW.	1	57 0 0	Dewusthan.
135	Waneh .	2,727	642	324	9½ SE.	5	50 11 11	Inamee.
136	Wejulpoor	3,253	678	370	4½ WSW.	2	Free.	Dhurmada.

DUSKROHIE JETULPOOR.

No.	Names of Villages.	Total Area.	Male Population 1st January 1848.	Number of Houses	Distance from Jetulpoor.	Shops.	Revenue in 1846-47	Tenure
		Acres.			Miles.		Rs. a. p.	
1	Bhoomal ..	1,675	225	105	10 E.	1	1,840 0 0	Khalsa.
2	Bakrolkhood ..	1,836	312	204	5 WNW.	5	2,409 0 0	"
3	Bareja ..	5,106	2,003	1,165	3 S.	47	17,049 0 0	"
4	Barejree ..	351	316	182	5 E.	4	1,645 0 0	"
5	Burodra	1,092	94	92	5½ ENE.	1	1,622 0 0	"
6	Chowar ..	1,447	307	225	2½ ENE.	3	2,624 0 0	"
7	Cheelrasur ..	1,946	904	259	9½ SSW.	4	2,607 0 0	"
8	Chuneendra ..	1,520	164	99	8 S.	2	2,319 0 0	"
9	Denree ..	1,901	250	151	3½ ENE.	7	2,247 0 0	"
10	Dhamuttan ..	3,022	720	429	9 ENE.	9	3,510 0 0	"
11	Durota ..	2,603	638	461	8 SSW.	6	2,870 0 0	"

No.	Names of Villages.	Total Area.	Male Population 1st January 1848.	Number of Houses.	Distance from Jetulpoor.	Shops.	Revenue in 1846-47.	Tenure.
		Acres.			Miles.		Rs. a. p.	
12	Estoolabad, or Gandeepoora.	325	28	22	3 ENE.	..	458 0 0	Khalsa.
13	Gamree ..	1,276	505	277	3 ENE.	6	5,320 0 0	"
14	Geerumta ..	1,862	835	472	3 W.	20	3,279 0 0	"
15	Heerapoor ..	2,136	634	312	7½ ENE.	10	3,447 0 0	"
16	Hurneeao ..	2,646	537	282	9 ENE.	5	3,561 0 0	"
17	Hathagun ..	2,325	501	290	5½ NE.	8	1,601 0 0	"
18	Jetulpoor ..	2,312	1,030	554	{ Distance from Ahmedabad 9 8. }	14	10,920 0 0	"
19	Jhinjhur ..	1,243	230	92	10½ E.	1	1,827 0 0	"
20	Kasundra ..	5,072	1,380	818	7 W.	38	8,832 0 0	"
21	Kumor ..	1,391	265	128	4½ WNW.	4	1,894 0 0	"
22	Kuneej ..	4,939	1,125	640	7 ESE.	14	6,151 0 0	"
23	Kutwara ..	1,997	117	72	6½ SSW.	1	4,445 0 0	"
24	Lalee ..	2,350	631	434	2½ SE.	10	5,789 0 0	"
25	Lambha ..	1,770	434	290	10 NNW.	5	3,741 0 0	"
26	Lukneepoora ..	592	57	39	3 NNW.	..	1,153 0 0	"
27	Meerolee ..	2,745	652	429	5 WSW.	9	228 0 0	"
28	Muheej ..	4,768	990	610	4½ ESE.	15	9,032 0 0	"
29	Muheejra ..	2,798	621	468	5½ SW.	9	472 0 0	"
30	Nowapoora ..	1,160	128	114	10½ WNW.	2	643 0 0	"
31	Naj ..	1,870	266	174	2 WSW.	5	3,779 0 0	"
32	Nanduj ..	2,292	461	279	5½ E.	3	4,155 0 0	"
33	Nuwagam ..	1,677	569	409	7 S.	14	7,228 0 0	"
34	Nuwapoora Dholka ..	1,016	230	112	7 SW.	1	79 0 0	"
35	Oondrel ..	2,406	357	177	12 ENE.	2	2,163 0 0	"
36	Ore ..	1,690	380	230	3½ WNW.	7	3,231 0 0	"
37	Palree ..	3,459	654	405	5½ W.	9	2,730 0 0	"
38	Pingluj ..	745	132	70	5½ S.	2	1,974 0 0	"
39	Raska ..	2,370	353	116	8 E.	4	2,710 0 0	"
40	Roheesa ..	1,513	264	135	9 E.	1	1,848 0 0	"
41	Ropra ..	293	74	35	4 NE.	..	{ Sidumee Rs. 8-3-1	Inamees for two lives.
42	Sarsa ..	1,459	352	190	5 SSE.	3	152 4 0	Dewusthan.
43	Syudpoor Go-palpoor ..	1,048	224	126	5 NNW.	2	1,575 0 0	Khalsa.
44	Teemha ..	1,798	399	287	5 SW.	9	234 0 0	"
45	Tajpoor ..	1,365	113	52	9½ W.	..	580 0 0	"
46	Usalalee ..	3,280	908	480	1½ W.	8	10,299 0 0	"
47	Veesulpoor ..	4,564	1,037	561	7 W.	12	5,354 0 0	"
48	Wusace ..	2,533	419	282	4½ SW.	8	357 0 0	"

DHOLKA PURGUNNA.

No	Name of Villages.	Total Area.	Male Population 1st January 1848.	Number of Houses.	Direct Distance from Dholka.	Shops.	Revenue in 1846-47.	Tenure.
		Acres.			Miles.		Rs.	
1	Ambareylee ..	2,889	632	480	6 SSW.	9	4,248	Khalsa.
2	Ambethee ..	1,222	134	79	3½ SE.	1	1,322	"
3	Amlee ..	910	253	130	20½ N.	2	2,351	"
4	Amleela (tulput)	2,188	729	469	4½ NE.	9	5,470	Talooka.
5	Amleela (wanta)	481					275	
6	Adrora ..	3,677	317	219	10 WNW.	5	1,717	Khalsa.
7	Bawula ..	5,743	1,767	1,186	8½ NW.	34	7,172	"
8	Bhaet ..	3,943	847	467	10 N.	26	5,188	"
9	Bhawunpoor	892	78	49	25 N.	1	475	"
10	Bopul ..	1,413	488	282	21 N.	2	4,004	"
11	Budurkha ..	2,753	1,049	631	7½ N.	22	4,435	"
12	Bhaela ..	4,437	306	281	8½ WNW	4	6,841	"
13	Bhetawara ..	974	146	77	3½ S.	1	Included in Khaleepoora	Talooka.
14	Bholad ..	7,062	474	400	21¾ SSW.	7	41,000	
15	Bohol ..	3,230	109	84	21 NW.	1	Included in Bholad	"
16	Buldana ..	3,421	205	152	14 WNW.	5	"	
17	Bigoowa ..	1,545	105	80	10 WSW.	1	Included in Gangur.	"
18	Bhamesra ..	4,478	102	65	13½ W.	.	"	
19	Bhoomlee ..	3,082	131	81	13 SSW.	2	"	"
20	Bhoorkee ..	3,925	239	156	17 SW	5	"	"
21	Bugodra ..	8,282	226	223	16½ WSW.	7	"	"
22	Boroo Nance ..	5,298	378	324	19¾ SSW.	4	Included in Ooteleela.	"
23	Boroo Molee ..	9,770	381	247	19½ SSW.	6	5,995	
24	Bukrana ..	5,881	311	117	24 NW.	5	2,200	"
25	Changodur ..	1,700	342	145	14 N.	2	1,156	Khalsa.
26	Chuk ..	264	2,044	1,449	2 NW.	.	636	"
27	Chulora ..	4,188						
28	Chundesur (tulput) ..	1,596	601	387	5½ NE.	3	1,889	Talooka.
29	Chundesur (wanta) ..	2,546					1,050	
30	Cheeturwara ..	1,163	136	93	13 S.	3	12,500	"
31	Cheera ..	2,878	241	159	6 WNW.	2	Included in Gangur.	"
32	Chokhla ..	5,964	148	64	23 N.	7	Included in Dheengara.	"
33	Chubaur ..	4,233	290	206	12½ WNW.		1,211	
34	Chural ..	1,754	111	83	20½ NW.	1	27	Khalsa.
35	Dheengara ..	2,610	133	108	11½ WNW.	3	2,056	"

No.	Names of Villages.	Total Area.	Male Population 1st January 1848.	Number of Houses.	Direct Distance from Dholka.	Shops.	Revenue in 1846-47.	Tenure.
		Acres.			Miles.		Rs.	
36	Dewtee Nunee, or Bhatnee	959	138	87	14 N.	1	549	Khalsa.
37	Dewtee	1,649	159	99	31 SW.	..	2,227	"
38	Dholka Kusba, 1 and 8 Pooras }	10,037	64054	8,811	{ Dist. from Ahmedabad 22 SW. }	247	13,295	"
39	Durun ..	3,018	267	143	11½ NW.	2	1,882	"
40	Dholec ..	3,333	171	120	11½ SSW.	3	1,398	"
41	Dew Dholera ..	2,929	402	259	16½ WNW.	8	1,554	"
42	Dhunwara ..	2,938	254	194	8 W.	6	2,083	"
43	Doorgee ..	5,698	201	115	22 WNW.	2	560	"
44	Dudooka ..	4,608	450	434	21 NW.	5	3,051	"
45	Doogarce ..	1,850	179	108	12½ S.	1 { Included in Khaleepoora. }		Talooka.
46	Dewurthul ..	5,213	89	50	20½ W.	1 { Included in Bholad. }		"
47	Dewtee Motee Wagrolanee ..	1,947	151	94	15 N.	..	"	"
48	Dedhal ..	1,524	165	111	9½ NW.	1 { Included in Gangur. }		"
49	Dheengara, and 1 Poora ..	5,551	146	137	19 SW.	6	1,800	"
50	Dhunala ..	4,489	215	165	24 SW.	5	1,261	"
51	Doomalce ..	6,178	172	113	17½ W.	7	950	"
52	Eengolee ..	1,952	466	363	9¼ SSE.	6	3,249	Khalsa.
53	Eeava ..	3,180	249	37	22 NNW.	2 { Included in Baborama. }		Talooka.
54	Ganesur ..	1,046	119	95	9¼ S.	1	515	Khalsa.
55	Gooma ..	1,772	740	408	20½ N.	5	4,583	"
56	Geerund ..	1,368	253	116	8 SE.	4	1,109	"
57	Goondee, and } Poora Wunalia .. }	5,232	258	130	18½ SW.	9 { Included in Bholad. }		Talooka.
58	Goruj ..	4,274	158	130	18 NNW.	8	"	"
59	Gangur, and 2 Pooras ..	14,151	796	733	11 WSW.	22	13,041	"
60	Goondana Poora.	1,170	24	24	18 WSW.	.. { Included in Gangur. }		"
61	Garol ..	3,197	269	193	10 S.	5	2,450	"
62	Goothavce ..	4,189	694	580	20 N.	59 { Included in Bukrana. }		"
63	Govinda ..	1,297	86	24	18 WNW.	..	"	"
64	Garoreea ..	1,005	205	97	22½ N.	2	500	"
65	Hussunnuggur ..	509	57	48	11 WNW.	..	508	Khalsa.
66	Husunpoo Kusba ..	511	Added to Dholka.	22	S.	..	890	"
67	Jhekra ..	1,231	284	191	6½ WNW.	4	1,361	"

No.	Names of Villages.	Total Area.	Male Population 1st January 1848.	Number of Houses.	Direct Distance from Dholka.	Shops.	Revenue in 1846-47.	Tenure.
		Acres.			Miles.		Rs.	
68	Jhoohar ..	4,329	229	134	13 NW.	1	1,809	Khalsa.
69	Jhoora ..	1,844	59	35	14 NW.	..	387	"
70	Julalpoor Kusba.	925	118	85	2½ NE.	1	2,381	"
71	Julalpoor Wujee- fa ..	699	496	268	2½ NE.	6	3,974	"
72	Juwal Roopawu- tee, or Ka- chceanee ..	2,150	162	109	4¼ NNW.	2	1,134	"
73	Jhakra ..	3,320	339	318	16 SSW.	6	3,223	"
74	Julalpoor God- neshwur .. }	1,815	145	85	5 WSW.	1 {	Included in Khalekpoora.	Talooka.
75	Juwaruj ..	5,284	390	330	16 SW.	7 {	Included in Bholad.	"
76	Kaneetha ..	2,984	866	552	8 N.	14	6,298	Khalsa.
77	Kerala ..	1,472	266	216	8 WNW.	2	2,755	"
78	Khanpoor ..	1,252	97	47	3 WSW.	..	410	"
79	Khurentee Roo- pawuttee ..	2,089	203	164	8 SW.	3	971	"
80	Kochreea ..	2,377	304	231	9 WNW.	8	3,003	"
81	Kureeana ..	1,872	115	184	8 SW.	8	652	"
82	Kuotur ..	3,741	179	121	16½ W.	2	939	"
83	Kesrundee ..	5,856	472	305	15 W.	10	3,345	"
84	Kuooka ..	4,831	737	551	8½ S.	5	5,273	"
85	Khalekpoora ..	355	..	..	7½ SSW.	..	5,612	Talooka.
86	Khatreepoor, or Machee Kha- tree ..	740	51	36	3½ ESE.	..	1,342	"
87	Kuvala ..	2,717	147	90	15 WNW.	4	500	Khalsa.
88	Kaleepoora ..	385	16	23	7½ SSW.	.. {	Included in Bholad.	Talooka.
89	Kolut ..	2,575	159	94	15½ N.	3	"	"
90	Koth ..	19,721	1,347	955	11 SW.	51	"	"
91	Kulana ..	2,507	96	130	24¼ NW.	1	"	"
92	Kheecha, or Cheecha .. }	895	68	48	15½ NNW.	.. {	Included in Ooteleea.	"
93	Kanetee ..	1,417	114	82	10¾ N.	..	450	"
94	Khora ..	2,931	87	69	22 NNW.	2	320	"
95	Kodaleea ..	748	26	14	15½ NW.	.. {	Included in Wucheea.	"
96	Koondul ..	3,501	173	91	18 NW.	5	1,583	"
97	Koovar, and 1 Poora ..	5,836	295	204	19 NW.	4	3,167	"
98	Kadeepoor ..	502	41	37	6 SW.	..	..	Inamee.
99	Lugdana ..	2,237	148	123	12 W.	3 {	Included in Cheeturwara.	Talooka.
100	Lodula ..	7,356	301	192	23 SW.	5 {	Included in Ootarea.	"

No.	Names of Villages.	Total Area.	Male Population 1st January 1848.	Number of Houses.	Direct Distance from Dholka.	Shops.	Revenue in 1846-47.	Tenure.
		Acres.			Miles.		Rs.	
101	Lekumba ..	1,229	106	52	16 NNW.	1	260	Talooka.
102	Lodreel ..	1,762	127	83	11 NNW.	1	1,000	"
103	Lana ..	1,763	144	101	3 W.	..	16	Dhurmada.
104	Mehumur ..	2,731	160	98	14 WSW.	..	591	Khalsa.
105	Mufleepoor ..	1,481	139	80	1 NNE.	..	1,501	"
106	Moojpoor Buhar- noo ..	879	39	21	2 $\frac{3}{4}$ SW.	.	290	"
107	Muneeppoor ..	1,014	179	122	21 N.	..	963	"
108	Mence ..	2,803	191	116	23 $\frac{1}{2}$ WNW.	2	443	"
109	Mutura ..	1,332	163	115	11 $\frac{1}{2}$ N.	3	1,621	"
110	Morasur ..	4,870	575	436	12 $\frac{1}{2}$ NNW.	11	Included in Bholad.	Talooka.
111	Mutamun ..	7,326	540	349	14 S.	12	"	"
112	Mehelasna ..	2,808	74	58	19 $\frac{1}{2}$ WNW.	..	Included in Mukheesao	"
113	Metal ..	3,708	307	196	16 $\frac{1}{2}$ WNW.	2	Included in Boroomota.	"
114	Moreca ..	3,194	335	197	13 $\frac{1}{2}$ N.	17	Included in Kookwar.	"
115	Mukheesao ..	5,408	295	156	19 $\frac{1}{2}$ NW.	10	2,713	"
116	Mankol ..	8,028	340	166	15 $\frac{1}{2}$ NW.	10	50	Khalsa.
117	Manodra ..	6,811	528	362	16 $\frac{1}{2}$ WNW.	10	3,394	"
118	Nesra ..	1,315	203	133	3 $\frac{1}{2}$ SSW.	.	Included in Talooka Cheeturwara.	Talooka.
119	Nubhole ..	1,129	211	155	11 S.	2	"	"
120	Neethrar ..	2,931	175	111	20 N.	1	Included in Bholad.	"
121	Ootelees ..	6,483	358	316	21 $\frac{1}{2}$ SW.	6	6,500	"
122	Palree Kuooka.	1,255	257	184	5 $\frac{1}{2}$ S.	2	1,680	Khalsa.
123	Peesawarar ..	5,278	587	568	6 $\frac{1}{4}$ SSE.	5	6,707	"
124	Palwara ..	1,259	103	73	13 N.	1	Included in Ootelees.	Talooka.
125	Phangree ..	2,405	149	105	15 NNW.	2	"	"
126	Peeplou ..	2,456	168	98	15 $\frac{1}{2}$ N.	1	Included in Bholad.	Khalsa.
127	Rampoor ..	1,240	194	112	21 $\frac{1}{2}$ ESE.	1	1,908	"
128	Rasum ..	2,170	507	349	8 NNW.	3	2,109	"
129	Roopal ..	2,143	383	332	7 NW.	1	3,804	"
130	Rujora ..	3,711	572	358	7 NNW.	6	2,731	"
131	Runora ..	2,461	244	183	21 $\frac{1}{2}$ N.	1	1,262	"
132	Rusikpoor ..	528	127	84	5 $\frac{1}{2}$ ESE.	1	1,658	"
133	Rarpoor ..	1,355	95	88	12 $\frac{1}{2}$ SSW.	1	704	"
134	Ranasur ..	1,433	221	175	11 W.	5	804	"
135	Rethul ..	5,722	575	455	19 $\frac{1}{2}$ NW.	13	2,509	"
136	Reejah ..	1,332	226	146	12 S.	4	Included in Cheeturwara.	Talooka.

No.	Names of Villages.	Total Area.	Male Population 1st January 1848.	Number of Houses.	Direct Distance from Dholka.	Shops.	Revenue in 1846-47.	Tenure.
		Acres.			Miles.		Rs.	
137	Roeeka..	4,347	79	56	14 WSW.	..	Included in Gangur.	Talooka.
138	Rajpoor ..	496	261	155	3 NE.	3	17	Dewusthan.
139	Sakodra ..	2,736	226	149	5½ W.	1	650	Khalsa.
140	Solejra ..	1,728	302	255	5½ NW.	7	4,921	"
141	Sanund..	10,300	2,195	1,713	18 N.	119	5,091	"
142	Santhul ..	4,460	690	535	3¼ E.	8	10,648	"
143	Seeawara (Sa- nund Tuppa)..	1,978	170	154	22½ NW.	4	2,420	"
144	Secawara (Khal- sa) ..	558	142	90	6½ W.	1	333	"
145	Seeluj ..	2,162	651	415	22½ N.	7	3,652	"
146	Shekhree ..	549	92	70	3 N.	..	1,288	"
147	Suheej ..	3,013	507	365	5 ESE.	6	5,979	"
148	Surora ..	2,903	888	538	7¼ NNE.	8	2,371	"
149	Sankor..	4,657	258	166	14 NW.	4	2,214	"
150	Seemuj ..	6,277	555	481	8½ SSW.	12	2,940	"
151	Seendroj ..	5,127	308	214	3 NW.	..	5,165	"
152	Surla ..	2,330	74	56	15½ WSW.	..	167	"
153	Surendee ..	3,856	160	87	5¼ WSW.	1	Included in Khaleepoora.	Talooka.
154	Soeela ..	1,386	57	39	16½ N.	..	Included in Bholad.	"
155	Suree ..	1,664	156	96	11½ NNW.	1	"	"
156	Surungwala ..	6,680	167	127	19½ SW.	6	"	"
157	Seel, and 1 } Poora .. }	21,625	214	153	18½ W.	9	Included in Gangur.	"
158	Sela ..	2,230	275	157	19 N.	2	Included in Ooteleca.	"
159	Sumanee ..	3,860	119	82	22 SW.	1	Included in Munkheas.	"
160	Transuj ..	1,588	491	389	3½ S.	1	3,191	Khalsa.
161	Telao ..	1,795	170	73	17½ N.	2	Included in Bholad.	Talooka.
162	Undharee ..	759	52	24	4¾ SE.	..	374	Khalsa.
163	Urasur ..	577	108	86	7½ NE.	2	999	"
164	Umurpoor, or Magasur Ku- poora ..	1,060	113	91	10 WNW.	2	..	Talooka.
165	Urnej ..	2,865	151	125	15 SW.	9	39	Dewusthan.
166	Veerpoor ..	1,651	220	178	6½ SE.	5	..	Inamee.
167	Wasna Kelcea ..	1,387	877	533	4 NNE.	3	6,900	Khalsa.
168	Wasna Chachra- waree ..	2,822	336	226	10 N.	2	4,045	"
169	Wasna Eeawa ..	2,170	67	72	21 NNW.	..	450	Talooka.
170	Wasna Dedhal..	1,593	142	111	11 NW.	1	1,238	"
171	Wasna Nanodra.	1,511	138	90	17 WNW.	3	1,145	Khalsa.

No.	Names of Villages.	Total Area.	Male Population 1st January 1848.	Number of Houses.	Distance from Veerungaum.	Shops.	Revenue in 1846-47.	Tenure.
		Acres.			Miles.		Rs.	
172	Wuootha (tulput)	1,852	354	270	7½ SE.	6	1,948	Khalsa.
173	Wuootha (wan-ta)	792					425	Talooka.
174	Walthera	4,341	243	208	7½ WSW.	3	1,130	Khalsa.
175	Wejee, or Kalee Tulaoree ..	4,777	125	107	20¼ WSW.	3	1,440	Talooka.
176	Wejulka	6,789	289	255	14¼ SW.	5	1,417	
177	Warna	7,087	562	433	16 S.	10	Included in Cheeturwara.	"
178	Weerde	1,688	159	119	8½ SSE.	4	"	"
179	Warlee	1,459	38	27	20¼ NNW.	..	Included in Bholad.	"
180	Weccheea	3,228	171	125	17 NW.	4	1,100	"
181	Wusodra	1,344	108	61	20 NNW.	1	....	Durmat.

VEERUNGAUM PURGUNNA.

No.	Names of Villages.	Total Area.	Male Population 1st January 1848.	Number of Houses.	Distance from Veerungaum.	Shops.	Revenue in 1846-47.	Tenure.
		Acres.			Miles.		Rs.	
1	Andej	3,708	268	160	17½ E.	..	1,099	Khalsa.
2	Ambasna	1,324	142	104	20½ NNE.	..	611	Muhemwasna.
3	Baora	1,297	63	37	9 NE.	..	210	Khalsa.
4	Boska	1,226	140	87	9½ NNE.	1	428	"
5	Budana	3,161	220	109	7 N.	..	686	"
6	Bhunkora	3,081	2,330	244	11¼ NNE.	12	4,891	Talooka.
7	Bhoenee noo } Poora }	205	..	..	20 NNE.	..	Included in Dekawara.	"
8	Bamrole	1,902	297	171	20¼ NNE.	1	Included in Kookoona.	"
9	Bhungapoora ..	2,838	40	32	15¼ N.	..	540	"
10	Bantee	866	59	45	21¼ NNE.	1	371	"
11	Bhutareea	786	74	55	26¼ NNE.	..	432	"
12	Bhoenee	1,845	152	101	20 NNE.	4	Included in Dekawara.	"
13	Baleesuna	2,199	273	211	25 NNE.	8	Included, ¼ in Chumun, ¼ Bhunkora, ¼ Bhungapoora.	"
14	Bhojeeva	7,640	387	234	2 NW.	3		"
15	Chor Burodra ..	8,449	866	165	11¼ E.	14	1,415	Khalsa.

No.	Names of Villages.	Total Area.	Male Population 1st January 1848.	Number of Houses.	Distance from Veerungam.	Shops.	Revenue in 1846-47.	Tenure.
		Aeres.			Miles.		Rs.	
16	Charoree ..	2,249	85	57	15 ESE.	..	144	Kusbatee.
17	Choonee no Poora	12	36	17	12 NE.	..	Included in Bukora.	Talooka.
18	Chunccar ..	2,691	332	234	14½ NNE.	12	1,929	"
19	Dudhana ..	4,187	265	163	19 N.	3	675	"
20	Dalod ..	4,677	310	219	17½ NNW.	3	1,168	Khalisa.
21	Danteesuna ..	2,885	211	159	25 NNW.	3	1,243	"
22	Deddasun ..	1,632	38	19	13½ NNW.	..	95	"
23	Deddeasuna ..	2,230	122	134	8 NNW.	2	1,522	"
24	Detroje, with 1 Poora	5,813	930	687	17 NNE.	31	3,857	"
25	Dhakree ..	2,035	130	57	6 NW.	1	1,113	"
26	Dhodur ..	2,660	75	31	14 ESE.	..	203	"
27	Doomana ..	1,722	137	95	1½ W.	2	747	"
28	Dauchee ..	2,568	78	65	16 SW.	1	504	"
29	Dermalla ..	5,525	171	77	20 SSW.	4	162	Talooka.
30	Duslana ..	3,089	325	240	9½ N.	5	Included in Bukora.	"
31	Dekawara ..	3,978	335	235	17½ NNE.	30	3,293	"
32	Damodree no Poora	539	94	51	18½ NE.	2	Included in Kookwao.	"
33	Dhabsur ..	1,259	182	113	23 N.	2	471	"
34	Dangurwa ..	2,385	221	182	22½ NNE.	4	½ Bukora, ½ Kookwao.	"
35	Endron. . .	1,941	411	53	4½ N.	..	Included in Bukora.	"
36	Endurpoora ..	377	71	45	20 NNE.	..	218	"
37	Futeppoor ..	476	51	26	22½ NNE.	1	189	"
38	Ghirdhurpoora. .	375	19	8	11 N.	..	½ Chunccar, ½ Blungapoora.	"
39	Gedcea. . .	3,372	350	247	17 WSW.	7	337	Khalisa.
40	Gbelra ..	1,041	178	122	20 NNE.	3	1,260	"
41	Ghatasna ..	782	189	108	15 NNE.	1	Included in Bhankora.	Talooka.
42	Goomanpoor ..	840	38	23	19 NNE.	..	Included in Dekawara.	"
43	Goonjala ..	2,997	325	102	21½ N.	4	729	"
44	Gorcea, with 1 Poora	12,221	633	452	8 W.	17	..	Inamee.
45	Ghora ..	4,995	421	297	12½ S.	7	..	"
46	Hansulpoor Bech- raja ..	2,010	121	72	26 NNW.	1	335	Khalisa.
47	Hansulpoor Sur- meshwur ..	6,843	91	86	2½ SSE.	1	1,023	"
48	Huthupoora ..	840	112	81	18 NNE.	2	Included in Kookura.	Talooka.
49	Jaleesna ..	4,299	244	154	19½ N.	3	1,268	Khalisa.

No.	Names of Villages.	Total Area.	Male Population in January 1846.	Number of Houses.	Distance from Veerungam.	Shops.	Revenue in 1846-47.	Tenure.
		Acres.			Miles.		Rs.	
50	Joona Padur ..	1,495	20	16	4 ¹ / ₂ N.	..	284	Khalsa.
51	Jhaup ..	6,124	454	352	22 ³ / ₄ SSE.	9	2,824	"
52	Jolapoor ..	6,009	334	238	13 SE.	3	4,621	"
53	Jukshce ..	1,610	79	39	5 ¹ / ₂ NNE.	..	344	"
54	Jukwara ..	1,979	212	167	6 ESE.	1	793	"
55	Juspoora ..	405	43	34	19 NNE.	1 {	Included in Dekawara.	Talooka.
56	Jelheepoora ..	606	77	35	21 NNE.	1	319	"
57	Jhanjurwa ..	1,942	168	118	20 ¹ / ₂ N.	3	401	"
58	Jelapoor ..	11,695	256	171	16 SSE.	4	..	"
59	Jheejra ..	3,526	402	230	15 S.	7	..	Inamce.
60	Kadeepoor ..	994	24	15	18 ¹ / ₂ ENE.	..	148	Khalsa.
61	Kachrol ..	2,499	306	198	22 N.	2	2,126	"
62	Kaleena ..	3,942	245	219	6 ¹ / ₂ WNW.	4	2,561	"
63	Kankrawalla ..	2,448	77	55	7 ¹ / ₂ SW.	..	557	"
64	Khara Ghora ..	2,979	101	75	20 ¹ / ₂ WNW.	1	901	"
65	Khetasur ..	1,754	24	14	10 ESE.	..	138	"
66	Kokta ..	487	126	89	3 ³ / ₄ NE.	..	465	"
67	Koomad Motce ..	2,714	83	39	4 E.	..	49	"
68	Keomad Nance ..	1,622	67	39	4 ¹ / ₂ E.	..	144	"
69	Koomur Khan ..	2,617	245	148	15 S.	2	1,550	"
70	Koonpoor ..	2,872	211	123	16 ¹ / ₂ N.	3	1,345	"
71	Khoord ..	2,874	262	149	7 NE.	2	695	"
72	Kulanpoor ..	1,335	92	68	8 ESE.	1	1,773	"
73	Kurecala ..	1,703	110	62	8 ¹ / ₂ NNE.	..	240	"
74	Kaleela ..	4,655	96	45	19 S.	2	482	Kushatee.
75	Koonteca ..	1,098	175	120	11 NNE.	2 {	Included in Bhunkora.	Talooka.
76	Kahanj. ..	3,424	425	300	14 NNE.	4	"	"
77	Kanpoora ..	461	35	26	10 ¹ / ₂ N.	..	"	"
78	Kantroree ..	1,183	63	32	12 ¹ / ₄	.. {	Included in Dekawara.	"
79	Kurapoora Mota ..	265	31	25	16 ¹ / ₂ NNE.	..	"	"
80	Kurapoora Nana ..	470	29	22	17 NNE.	..	"	"
81	Kookwao ..	1,419	227	187	18 ¹ / ₂ NNE.	7	3,387	"
82	Kursunpoora ..	1,310	8,031	31	12 ¹ / ₂ N.	.. {	Included in Chunecar.	"
83	Keemecjla ..	7,052	255	163	13 S.	8	"	"
84	Khetwa ..	11,725	368	260	20 ¹ / ₂ WSW.	11	"	"
85	Kurwasun ..	3,702	119	99	13 ¹ / ₂ NW.	2	"	"
86	Khengareca ..	1,533	54	41	6 ¹ / ₂ S.	..	"	"
87	Leea ..	3,094	120	83	8 SSE.	2	608	Kushatee.
88	Leemur ..	1,704	43	27	8 ¹ / ₂ SSW.	..	..	Talooka.
89	Marosna ..	644	141	85	19 NNE.	1	320	Khalsa.
90	Mehemudpoor ..	1,295	..	..	6 ¹ / ₂ ENE.	..	15	"
91	Meluj ..	1,364	286	183	8 ENE.	2	770	"
92	Mand.J ..	14,552	1,915	1,262	14 ¹ / ₂ NW.	85	4,731	"

No.	Names of Villages.	Total Area.	Male Population 1st January 1848.	Number of Houses.	Distance from Veerungam.	Shops.	Revenue in 1846-47.	Tenure.
		Aeres.			Miles.		Rs.	
93	Modhwana ..	2,958	158	123	23 SW.	2	355	Talooka.
94	Mudreesuna ..	1,271	112	73	21 NW.	2	Included in Kookwao. }	"
95	Nathpoora ..	412	118	75	19 NNE.	1		
96	Narunpoor ..	813	16	10	16 ESE.	..	13	"
97	Nackpoor ..	2,616	225	146	21 NNW.	1	2,031	"
98	Neelkee ..	1,156	21	10	21 N.	..	131	"
99	Nudecana ..	1,711	46	21	5½ NNE.	..	281	"
100	Nuwagam ..	2,529	120	91	11½ NW.	1	767	"
101	Nudeesla ..	1,331	121	77	20 NNE.	1	Included in Dekawara. }	Talooka.
102	Oopurdul ..	3,983	117	115	19½ SSE.	1		
103	Odhuv ..	1,151	56	41	20½ N.	1	316	"
104	Oomedpoor ..	157	18	13	18 N.	..	Included in Dekawara. }	Talooka.
105	Oobra Nana ..	4,182	360	170	11 NNW.	1		
106	Oogroj ..	3,226	173	116	17½ N.	2	Included in Channeer. }	Talooka.
107	Ogan ..	9,915	758	179	10 SE.	9		
108	Ookurdee, with 2 Pooras ..	2,932	159	81	15 N.	1	517	Talooka.
109	Oochurpee ..	511	101	75	4½ NNE.	..	786	Khalsa.
110	Oogroj no Pooras ..	1,259	58	43	17½ N.	..	Included in Ookurda. }	Talooka.
111	Ooklar, with 1 Pooras ..	1,410	199	129	6½ N.	1		
112	Pumar ..	4,611	210	146	10 NE.	4	372	"
113	Patree ..	20,187	2,295	1,763	17 WNW.	64	..	"
114	Rebree ..	2,871	83	49	12 NNW.	..	264	Khalsa.
115	Rehemulpoor ..	3,138	81	51	3½ SSW.	..	329	"
116	Roonee ..	2,128	23	11	33½ NW.	..	146	Talooka.
117	Rukhecana ..	1,413	126	80	13 NNW.	1	459	Khalsa.
118	Runode ..	2,997	77	37	32½ NW.	2	212	Talookdareo.
119	Rampoora ..	2,221	403	322	12 NNE.	47	Included in Bhunkora. }	"
120	Ruttonpoora ..	263	32	25	17½ NNE.	..		
121	Rajpoora ..	720	61	44	23½ NNE.	..	Included in Dekawara. }	"
122	Rantee Motce ..	1,024	61	46	22 NNE.	1		
123	Rantee Nance ..	911	63	35	22 NNE.	2	471	"
124	Roondatul, with 1 Pooras ..	3,308	267	217	21 NNE.	4	1,082	"
125	Sadra ..	1,263	38	18	15 NNW.	..	49	Khalsa.
126	Ser ..	2,239	..	..	13½ NNW.	..	43	"
127	Seetapoor ..	9,151	690	436	23½ NNW.	7	3,429	"

No.	Names of Villages.	Total Area.	Male Population 1st January 1848.	Number of Houses.	Distance from Veerungam.	Shops.	Revenue in 1846-47.	Tenure.
		Acres.			Miles.		Rs.	
128	Sobhasun ..	1,509	260	145	21½ NNE.	2	1,123	Khalsa.
129	Soklaee ..	1,658	46	36	4 ESE.	..	156	"
130	Solgam ..	3,291	247	133	14 N.	4	1,040	"
131	Sakur ..	3,455	105	76	19 SSW.	..	923	"
132	Sursawaree ..	2,219	112	60	6½ NE.	..	196	"
133	Shapoor, with 1 Poora ..	10,240	164	105	17 S.	7	149	Kusbatee.
134	Suhulpooora ..	251	14	10	18 NNE.	.. {	Included in Dekawara.	Talooka.
135	Sungpooora ..	421	58	48	17½ NE.	1 {	Included in Kookwao.	"
136	Sudatpooora ..	2,115	126	112	16 NNE.	1 {	Included in Ugar.	"
137	Secnuj, with 2 Pooras ..	4,083	232	150	22 N.	1	471	"
138	Soowala ..	1,541	215	117	24 NNE.	3	1,250	"
139	Soojpooora ..	1,070	50	33	25 NNE.	..	423	"
140	Seelore ..	2,606	275	173	13 N.	2 {	½ Chander, ½ Bhungapooora.	"
141	Saolana ..	6,141	221	189	20½ SW.	5	..	"
142	Suchana ..	5,468	245	156	8½ ESE.	3	..	Inanee.
143	Sootarkee ..	1,388	31	16	12 ESE.	..	461	Khalsa.
144	Thoree Moobaruck ..	4,041	85	46	5 S.	1	372	Kusbatee.
145	Thoree Thamba ..	2,919	103	72	8 S.	..	101	"
146	Thoree Wurgao ..	1,897	79	48	5½ WSW.	..	118	"
147	Tunnucea ..	3,462	38	29	23 SW.	2	511	Talooka.
148	Tebance ..	1,886	186	132	26 NNE.	7	620	"
149	Tret	6,036	335	171	7½ NNW.	3	1,111	Khalsa.
150	Thoolceta ..	3,232	209	118	13 SSE.	1	..	Inanee.
151	Umcealee ..	2,468	87	61	20½ S.	1	868	Khalsa.
152	Usulgam ..	3,154	135	99	15½ S.	2	2,208	"
153	Ughar, with 1 Poora ..	5,674	315	216	9 NNE.	2	1,176	Talooka.
154	Umurpooor ..	675	31	22	24 NNE.	..	283	"
155	Veerungam } Kusba. . }	10,833	8,525	5,515	{ Dist. from Ahmedabad 58 W. by N. }	112	5,734	Khalsa.
156	Veetlapoor ..	4,873	315	232	17 N.	4	611	Talooka.
157	Veekreca ..	8,551	206	181	21 S.	6	..	"
158	Wasna Koonpooor ..	1,384	146	79	17 N.	2	1,217	Khalsa.
159	Weechun ..	1,256	231	160	20 N.	3	705	"
160	Weejoowara ..	4,207	263	159	18½ NNW.	3	2,459	"
161	Wulana ..	2,577	14	8	2 NNE.	..	545	"
162	Wunaleca ..	2,672	136	140	20½ SSE.	2	1,855	"
163	Wunpurdce ..	2,061	234	152	19 NNW.	2	1,596	"
164	Wuumor ..	5,479	364	274	19 NNW.	6	2,728	"
165	Wusweleca ..	2,296	112	81	8 S.	1	903	"

No.	Names of Villages.	Total Area.	Male Population 1st January 1848.	Number of Houses.	Distance from Veerunggaum.	Shops.	Revenue in 1846-47.	Tenure.
		Acres.			Miles.		Rs.	
166	Wunce . .	7,198	98	67	8 $\frac{3}{4}$ WSW.	1	316	Kusbatce.
167	Wurthul . .	3,415	61	45	10 S.	..	157	"
168	Wasna Leemeer.	1,837	219	150	{ Dist. 3 miles NW. of Dandooka Kusba }	..	601	Talooka.
169	Wasna Choowal.	1,394	121	96		..	1,282	Khalsa.
170	Weergas . .	2,997	211	163	7 WSW.	2	..	Kushatce.

PURANTEJE PURGUNNA.

No.	Names of Villages.	Total Area.	Male Population 1st January 1848.	Number of Houses.	Distance from Puranteje.	Shops.	Revenue in 1846-47.	Tenure.
		Acres.			Miles.		Rs.	
1	Ageeol, with 2 Pooras . .	1,920	364	186	14 $\frac{3}{4}$ NE.	20	744	Khalsa.
2	Akodura . .	1,164	172	85	11 $\frac{1}{2}$ NE.	2	745	"
3	Ambawara . .	2,432	388	191	8 $\frac{1}{2}$ E.	13	2,073	"
4	Amora . .	2,056	221	109	8 $\frac{3}{4}$ ENE.	..	929	"
5	Asrora . .	1,185	160	80	9 $\frac{3}{4}$ ENE.	1	736	"
6	Anjna . .	1,334	89	44	7 SE.	..	717	"
7	Antrolee (Poon-jajee), with 2 Moowarces or hamlets . .	176	87	49	12 ESE.	6	75	Mehwasce.
8	Antrolee (Doljee) with Moowarces . .	3,643	472	224	12 ESE.	12	258	"
9	Alumpoor . .	1,110	10	4	25 $\frac{1}{2}$ E.	..	19	Khalsa.
10	Ambagam . .	1,169	77	42	30 SE.	..	277	"
11	Amechnpoor . .	743	114	73	2 ENE.	1	622	"
12	Amodra . .	2,014	184	79	34 $\frac{1}{2}$ SE.	..	175	Mehwasce.
13	Bakurpoor . .	491	163	71	1 $\frac{1}{2}$ SE.	..	335	"
14	Balcesuna . .	2,850	531	243	4 $\frac{3}{4}$ SSE.	10	1,369	"
15	Boosar . .	2,869	104	55	14 $\frac{1}{2}$ ENE.	3	280	"
16	Bobha . .	1,862	244	97	6 $\frac{1}{2}$ SW.	4	976	"
17	Borcea Koord . .	821	8	6	10 NNE.	..	94	"
18	Bhurakea . .	661	45	24	6 S.	..	126	Khalsa.
19	Bacene Moowa . .	352	149	66	5 SSE.	1	205	Mehwasce.

No.	Names of Villages.	Total Area.	Male Population 1st January 1848.	Number of Houses.	Distance from Puranteje.	Shops.	Revenue in 1848-47.	Tenure.
		Acres.			Miles.		Rs.	
20.	Bhadurjee nee Moowaree ..	176	52	24	5 ESE.	..	125	Mehwasee.
21.	Bhatee ..	362	84	51	7½ S.	1	175	"
22.	Borecawas Beeh-rajee, with 1 Moowaree ..	1,880	257	157	12¾ SSE.	3	250	"
23.	Burodra ..	1,037	334	145	14 SE.	11	630	"
24.	Bajkot ..	1,724	21	12	29 ENE.	..	120	Khalsa.
25.	Baronolee ..	2,120	113	39	30¼ ESE.	..	265	"
26.	Beelwanee, with 3 Moowarees ..	1,320	36	15	27½ ESE.	..	134	"
27.	Bhesuwara ..	1,378	182	98	22¼ E.	..	720	"
28.	Boolal ..	3,745	206	75	27½ ESE.	..	869	"
29.	Burodura ..	3,169	152	51	36½ E.	..	284	"
30.	Bayur Cusba ..	7,603	1,072	561	27¾ SE.	25	2,659	{ Half Khalsa, and half Marwarce.
31.	Chadurda ..	1,556	147	80	11 ENE.	1	741	Khalsa.
32.	Chundpoor ..	117	16	9	5 SE.	..	10	Mehwasee.
33.	Chekhla Mota ..	1,057	185	79	12¾ E.	3	271	"
34.	Chekhla Nana ..	705	269	95	12 ESE.	2	354	"
35.	Choecia ..	4,526	687	430	25 SE.	10	2,041	{ Half Khalsa, and half Marwarce.
36.	Dadurda ..	1,252	103	48	9½ ESE.	1	465	Khalsa.
37.	Desasun ..	1,034	55	26	14 NE.	..	147	"
38.	Dulpoor ..	2,388	103	41	7 NE.	..	1,127	"
39.	Dowlutabad ..	954	263	102	7 SSE.	1	475	Mehwasee.
40.	Dulance Moowaree, with 1 Moowaree ..	852	151	68	6 SSE.	7	281	"
41.	Dhoonawara ..	1,031	19	7	21 E.	..	42	Khalsa.
42.	Dhunsoora ..	7,878	825	415	23½ ESE.	17	2,793	"
43.	Durecapoor ..	1,119	11	10	3½ E.	..	35	"
44.	Dchemace ..	4,781	519	321	29½ SE.	14	1,846	"
45.	Duckneshwar ..	1,872	167	77	29 SE.	..	573	"
46.	Derolee ..	1,351	231	101	31¼ SSE.	..	301	Mehwasee.
47.	Endrajpoor ..	352	41	16	8 WSW.	..	15	"
48.	Eentance ..	765	206	96	22 E.	..	..	Dewasthan.
49.	Eendran ..	2,527	338	155	36 SE.	..	375	Mehwasee.
50.	Eutepoor (Motee) ..	2,615	330	157	10¾ ENE.	27	1,022	"
51.	Eutepoor Koord ..	536	..	..	5 S.	..	181	"
52.	Ghurce ..	4,999	476	238	7¼ E.	20	2,412	Khalsa.
53.	Gurkhun ..	1,435	529	271	6½ S.	41	1,801	"
54.	Gulesra ..	1,452	58	31	3 W.	..	291	"
55.	Gumbheerpoor ..	688	38	15	9½ SE.	..	151	"
56.	Gabut ..	4,435	1,304	535	33 ESE.	9	1,023	Marwarce.
57.	Garoree ..	1,259	24	16	23 E.	..	101	Khalsa.

No.	Names of Villages.	Total Area.	Male Population 1st January 1848.	Number of Houses.	Distance from Purantje.	Shops.	Revenue in 1846-47.	Tenure.
		Acres.			Miles.		Rs.	
58	Gajun	587	75	30	29½ ENE.	..	35	Mehwasee.
59	Gamree. . .	761	40	23	16 NE.	..	15	"
60	Hursole Kusba .	5,691	787	532	11¼ SE.	95	526	Marwarree.
61	Humneedpoor ..	361	..	..	29 E.	..	31	Khalsa.
62	Hussabad .. .	1,002	91	40	30 ENE.	..	117	Dhurmadra.
63	Hajeeppoor ..	1,423	57	24	9¼ NE.	..	510	Khalsa.
64	Jeetar .. .	980	32	19	9½ NNE.	..	191	"
65	Jenpoor .. .	951	90	31	5½ ESE.	..	241	"
66	Jhinjoowa ..	2,372	300	162	5½ ENE.	5	2,198	"
67	Jorajee nee Moo- waree .. .	1,231	215	130	13 SSE.	2	300	Mehwasee.
68	Jhalanee Moo- waree .. .	264	125	61	5½ SSE.	4	195	"
69	Jeetpoor or Goo- labchawan nee Moowaree ..	852	22	10	10 SE.	..	215	Marwarree.
70	Kabaula .. .	710	..	61	SE.	..	200	Khalsa.
71	Kherol. . .	2,144	186	78	10½ SSE.	5	862	"
72	Kutepoor .. .	1,129	77	31	1 WNW.	..	758	"
73	Kural .. .	2,181	188	257	5 S.	31	2,100	"
74	Kulepoor .. .	1,036	46	28	1½ SSW.	..	889	"
75	Kesurpoor ..	1,469	91	47	5½ SSE.	..	150	Mehwasee.
76	Kamlee .. .	352	27	10	2¼ ESE.	..	43	Khalsa.
77	Khuroda .. .	2,665	134	67	22½ E.	..	524	"
78	Khudol. . .	2,424	154	58	28 ESE.	..	320	"
79	Koleekur .. .	1,741	136	57	26 E.	..	321	"
80	Kolwura .. .	1,823	197	69	26½ ESE.	2	637	"
81	Kumalcca ..	1,623	18	8	31 ESE.	..	49	"
82	Kuso .. .	580	202	73	29½ ESE.	..	476	"
83	Kojun .. .	1,175	23	13	3¼ SE.	..	99	"
84	Lalpoor .. .	676	12	5	5½ E.	..	44	"
85	Lebula. . .	1,152	117	70	2½ S.	1	631	"
86	Mahadeopoor..	1,917	127	87	7 ENE.	2	402	"
87	Mamrolee .. .	843	81	37	1¾ S.	..	383	"
88	Muoocha .. .	1,413	115	55	9 ENE.	..	315	"
89	Mehekal .. .	1,491	74	18	14 SSE.	..	568	"
90	Mehclao .. .	802	..	8	SSE.	..	Entirely set apart as grass land for the Government horses at Hur- sole.	"
91	Mehemudpoor..	1,443	102	39	4¾ E.	..	243	"
92	Moralee .. .	1,026	47	19	6½ E.	..	230	"
93	Mejura. . .	1,498	229	123	6½ SW.	8	720	Talooka of Oran. .
94	Mayund .. .	2,292	322	156	6 N.	7	511	Mehwasee.
95	Mayund .. .	2,292	417	228	6 N.	22	1,213	"
96	Mawajcenee Moo- waree. . .	44	21	9	5½ SSE.	..	15	"

No.	Names of Villages.	Total Area.	Male Population 1st January 1848.	Number of Houses.	Distance from Puranteje.	Shops.	Revenue in 1846-47.	Tenure.
		Acres.			Miles.		Rs.	
97	Mokumjree nee							
	Moowaree ..	117	16	16	8 S.	..	25	Mehwasee.
98	Modasuna ..	822	238	113	7½ S.	8	480	"
99	Mahadeoghur or Khokra ..	868	39	18	9¼ SE.	..	248	Khalsa.
100	Moteesir ..	986	..	..	9 ESE.	..	305	"
101	Mizapoor ..	590	..	..	29	..	67	"
102	Mathusoolca ..	1,663	68	28	32¼ E.	..	144	"
103	Morassa Kusba.	3,474	2,187	1,572	28 E.	107	600	{ Half Khalsa & half Marwaree.
104	Moruree ..	345	..	..	33¼ ENE.	..	34	Khalsa.
105	Mudapoor ..	1,377	21	9	27½ ENE.	..	55	"
106	Mulekpoor ..	891	44	21	27 ESE.	..	122	"
107	Naduree Petha-poor. ..	1,830	45	34	8¾ NNE.	..	275	"
108	Neekeoree ..	667	73	37	11 ENE.	..	427	"
109	Nunapoor ..	1,822	214	106	8 NE.	7	1,252	"
110	Nuwagaum ..	961	..	..	1½ NW.	..	323	"
111	Nuwanuggur ..	1,280	125	88	11½ S.	12	791	"
112	Nuwawas ..	470	167	87	11¼ SSE.	4	301	Mehwasee.
113	Oocha ..	1,036	257	123	3 SSE.	5	793	Khalsa.
114	Oojereea ..	2,237	658	328	11½ SSE.	15	1,255	Mehwasee.
115	Ora ..	2,690	1,430	733	4 SW.	85	2,761	Talooka.
116	Ora, and 1 Poor-ra ..	1,692	150	72	33 SE.	2	248	Khalsa.
117	Peeplodee ..	678	..	..	11¼ NNE.	..	49	"
118	Peeplodee, Bayur Purgunna ..	1,316	49	19	31 SE.	..	130	"
119	Pogol ..	1,799	375	176	3 NE.	3	1,727	"
120	Pooral ..	1,281	115	51	12 NE.	..	549	"
121	Pulachur ..	1,499	221	115	3 ENE.	3	925	"
122	Puranteje Kusba.	4,347	393	3,082	{ Dist. from Ahmedabad 32 NNE. }	260	1,985	"
123	Pudhacra ..	798	48	20	7 S.	1	162	"
124	Peelodra ..	987	365	179	3¼ N.	2	810	Mehwasee.
125	Poerda ..	499	117	55	6¾ WSW.	1	65	Khalsa.
126	Poonadra ..	235	60	27	6¾ S.	..	120	Mehwasee.
127	Poosree ..	3,604	547	250	16¼ ESE.	18	1,088	Khalsa.
128	Pudoosun ..	1,292	419	180	13 SE.	9	720	Mehwasee.
129	Parpoor ..	2,216	82	39	26½ E.	..	379	Khalsa.
130	Rastor ..	1,803	172	72	21½ SE.	1	1,276	"
131	Ruttanpoor or Mutesun ..	1,165	38	19	4¾ SE.	..	159	"
132	Roopal ..	352	102	83	5 SE.	6	400	Mehwasee.
133	Rampoor ..	1,048	32	16	10½ SE.	..	113	Marwaree.
134	Rojhur ..	5,328	141	58	16 SE.	1	45	Mehwasee.
135	Rupun ..	742	28	12	29 E.	..	161	Khalsa.

	Names of Villages.	Total Area.	Male Population 1st January 1846.	Number of Houses.	Distance from Puraheje.	Shops.	Revenue in 1846-47.	Tenure.
		Acres.			Miles.		Rs.	
136	Rubejee ..	1,142	40	17 28	SE.	..	200	Khalsa.
137	Rusoolpoor ..	559	138	79 3½	NNE.	1	631	"
138	Sadoleea ..	777	51	27 2½	WNW.	..	256	"
139	Sakroreea ..	747	65	27 14½	ENE.	..	145	"
140	Sonasan ..	2,861	619	290 5½	NE.	34	5,650	"
141	Sookhur * ..	855	120	49 8½	SSW.	..	739	"
142	Sulal ..	1,614	250	139 4½	NNE.	3	1,275	"
143	Seetwara Was Merajee ..	617	157	80 5	WSW.	3	140	"
144	Seetwara Was Wustajee ..	793	211	100 5	WSW.	7	380	Mehwasee.
145	Sudda nee Moo- waree ..	705	81	48 7	S.	2	380	"
146	Sooltanpoor ..	1,334	39	19 12½	SE.	..	189	Marwaree.
147	Saghpoor ..	705	111	56 16	SE.	3	65	Mehwasee.
148	Sakreea ..	5,066	166	64 31	E.	1	714	Khalsa.
149	Sayura ..	2,444	440	213 30½	ENE.	9	1,599	"
150	Seetpoor ..	513	15	8 25	E.	..	34	"
151	Seemlee ..	734	58	26 25½	ESE.	..	107	"
152	Suroorpoor ..	1,331	36	15 34	E.	..	70	"
153	Surkhundee ..	2,844	39	19 30	ESE.	..	..	Dhurmada.
154	Tanturda ..	782	20	8 6½	SSE.	..	215	Khalsa.
155	Thoomra ..	562	57	27 13	NE.	..	..	Dewasthan.
156	Tulod ..	4,860	370	173 7½	SE.	11	2,135	Khalsa.
157	Tajpoor ..	2,371	156	84 12½	ESE.	2	488	Talooka.
158	Tajpoor (Oran Talooka) }	1,347	275	150 5	SSW.	.. {	Included in Oran.	Talookdaree
159	Talor ..	2,012	64	39 32½	SE.	..	433	Khalsa.
160	Umrappoor ..	948	79	28 5½	SE.	..	161	"
161	Unceor ..	2,350	268	121 13½	SE.	9	625	Mehwasee.
162	Wadhrota ..	1,374	187	93 7½	ENE.	7	1,202	Khalsa.
163	Waoree ..	401	29	14 8	ESE.	..	62	"
164	Wudrar ..	2,127	337	133 3	E.	6	1,572	"
165	Wellampoor ..	633	85	43 8½	SSE.	1	764	"
166	Wanee and Kurneepoora }	689	45	26 10½	SSE.	.. {	Included in Oran.	Talooka.
167	Wurwasa ..	682	135	75 4	SSW.	..	..	"
168	Waghpoor ..	4,548	710	268 3½	NNW	43	300	Mehwasee.
169	Wantra Sooka ..	1,830	38	17 29	ESE.	..	81	Khalsa.
170	Wantra Kawut.	586	20	10 28½	SE.	..	133	"
171	Wantra, near Ba- yur ..	600	..	.. 26½	SE.	..	47	"
172	Wuneead ..	1,486	123	58 34½	ENE.	2	152	{ Half Khalsa & half Marwaree.
173	Wana ..	1,049	47	26 27	SE.	..	122	Khalsa.
174	Wanee Bel ..	842	105	48 25½	SE.	..	602	"
175	Watrakhar ..	2,356	10	7 24	SE.	..	300	"

DHUNDOOKA PURGUNNA.

No.	Names of Villages.	Total Area.	Male Population 1st January 1848.	Number of Houses	Distance from Dhundooka.	Shops.	Revenue.	Tenure.
		Acres.			Miles.		Rs. a. p.	
1	Amlee ..	23,137	1,127	485	15 E.	7	1,980 5 3	Khalsa.
2	Akroo ..	7,352	401	175	17½ S.	4 {	Included in Khudal.	Talooka.
3	Alumpoor ..	3,294	404	100	16½ SW.	4	1,009 10 5	"
4	Bhureead ..	16,718	1,804	923	13½ SE.	27	2,822 1 8	Khalsa.
5	Bhangur, and Pooras ..	1,708	1,199	577	22 SE.	1	3,701 11 4	"
6	Borejra. .	10,697	946	410	17½ N.	20 {	Included in Khudal.	Talooka.
7	Burwala ..	10,392	3,331	1,091	16½ SW.	61	"	"
8	Bhanbun ..	1,839	447	151	22½ S.	5 {	Included in Burbheer.	"
9	Burbheer (Pat-na) ..	1,288	133	53	24 SE.	2	20,000 0 0	"
10	Bcla ..	2,807	274	73	15 SW.	1	335 0 0	"
11	Bhowlcearee ..	6,623	604	258	22 SE.	7	1,151 0 0	"
12	Bulgamra ..	1,659	420	177	5½ S.	4	"	Inamsee.
13	Bolarid. .	14,103	3,544	1,312	22½ SW.	126	11,500 0 0	Talooka.
14	Boorancea ..	2,155	114	74	10½ W.	3 {	Included in Malunpoor.	"
15	Bhurdla ..	3,179	217	56	24 W.	2	850 0 0	"
16	Birhana ..	2,702	303	96	25½ NW.	2	360 0 0	"
17	Boobawao ..	1,874	157	57	18 SW.	3	800 0 0	"
18	Bugud. .	5,422	1,010	408	15 SW.	8	3,541 7 11	Khalsa.
19	Borcea. .	2,594	172	164	12 SW.	.. {	Included in Malunpoor.	Talooka.
20	Chachreca ..	1,962	186	74	16½ SW.	2 {	Included in Khudal.	"
21	Chunderwa ..	4,732	443	197	9 SW.	9	"	"
22	Chukumpoor ..	603	77	36	27 S.	.. {	Included in Burbheer.	"
23	Charoreca ..	2,882	320	43	3 N.	1	1,700 0 0	"
24	Charunkee ..	2,951	351	155	12 SW.	4	430 0 0	"
25	Cher ..	14,044	170	105	9 SE.	3	601 0 0	"
26	Chadceone ..	3,702	456	144	6 W.	4	1,350 0 0	"
27	Chapurkoo Mota.	3,393	..	..	12½ S.	.. {	Included in Malunpoor.	"
28	Chapurkoo Nancee ..	{ Included in Chapurkoo Mota. }	..	..	12 W.	..	"	"
29	Chokree ..	30,560	537	173	10½ S.	8	1,450 0 0	"
30	Chorvera ..	1,480	81	10	25½ W.	1	250 0 0	"
31	Dhudedur ..	{ Included in Burwala. }	..	..	16½ S.	.. {	Included in Khudal.	"

No.	Names of Villages.	Total Area.	Male Population 1st January 1848.	Number of Houses.	Distance from Dhundooka.	Shops.	Revenue.	Tenure.
		Acres.			Milos.		Rs. a. p.	
32	Dantreetees ..	11,658	80	36	21 S.	..	{ Included in Burbheer. }	Talooka.
33	Dhundooka } Kusba ..	11,658	7,261	2,914	{ Dist. from Ahmedabad 60 SE. }	153	20,264 0 0	Khalsa.
34	Deoguna ..	4,267	305	88	10½ SW.	4	2,401 0 0	Talooka.
35	Dholara ..	11,298	6,807	2,896	15 E.	429	515 0 0	"
36	Dhankneea ..	2,509	35	14	21 SW.	..	{ Included in Botund. }	"
37	Dharpeepla ..	4,258	603	178	19½ W.	4	3,200 0 0	"
38	Derdee ..	1,181	94	19	18 W.	1	200 0 0	"
39	Demleea ..	1,439	307	235	10½ W.	5	1,400 0 0	"
40	Dhekwalce ..	1,801	268	90	19 SW.	2	{ Included in Burbheer. }	"
41	Gogla ..	7,501	302	131	15 E.	..	1,451 6 10	Khalsa.
42	Godhawuta ..	2,882	202	87	13½ SW.	2	{ Included in Khudal. }	Talooka.
43	Goonda ..	3,446	656	223	15 SW.	7	" " "	"
44	Gaunph ..	14,237	2,266	1,219	10½ E.	16	5,251 0 0	"
45	Ghorasoo ..	14,105	560	191	11½ SE.	1	{ Included in Gaunph. }	"
46	Gudeca ..	2,365	34	10	18 W.	..	150 0 0	"
47	Goreca ..	988	84	39	31½ SW.	1	{ Included in Sumundeala, in Raupoor. }	"
48	Gulsana ..	2,997	489	83	7½ W.	4	2,350 0 0	"
49	Gungajul ..	3,701	93	30	33 SW.	..	250 0 0	"
50	Hardur ..	2,284	144	56	21 SW.	2	{ Included in Botund. }	"
51	Hanoulpoor {	{ Includ- ed in Dhar- peepla. }	36	15	16½ W.	..	{ Included in Dharpeepla. }	"
52	Hurmutalla ..	2,208	310	95	13½ SW.	4	1,260 0 0	"
53	Hurneeso ..	4,284	95	36	39 W.	2	200 0 0	"
54	Hebutpoor ..	23,508	294	169	15 SW.	1	751 0 0	"
55	Jaleela ..	6,851	1,059	294	12 SW.	8	{ Included in Khudal. }	"
56	Jhinjawuddur ..	2,603	439	188	21 SW.	6	{ Included in Burbheer. }	"
57	Jotingra ..	1,481	84	21	24 SW.	..	"	"
58	Jeemralla ..	3,937	615	273	18 S.	7	"	"
59	Jalleca ..	3,452	254	97	1½ N.	1	1,800 0 0	"
60	Jhanjurka ..	4,655	315	112	4½ N.	3	1,301 0 0	"
61	Jhinjur ..	3,963	529	203	4½ S.	4	1,501 0 0	"
62	Jhureea ..	1,222	44	12	24 SW.	..	{ Included in Botund. }	"
63	Juska ..	5,171	752	363	4½ SW.	10	2,421 0 0	"
64	Jurwalla ..	1,851	413	152	9 S.	..	..	Inamee.

No.	Names of Villages.	Total Area.	Male Population 1st January 1848.	Number of Houses.	Distance from Dhundooka.	Shops.	Revenue.	Tenure.
		Acres.			Miles.		<i>Rs. a. p.</i>	
65	Kumecalla, and							
	1 Poora ..	4,541	518	213	13½ NE.	8	1,147 3 8	Khalsa. Talooka.
66	Khudal ..	9,873	635	316	4½ NE.	5	14,713 15 2	
67	Khambra ..	4,235	758	251	15 SW.	7 {	Included in Khudal.	"
68	Koondul ..	4,111	236	87	15 SW.	8 {	"	
69	Kona Tuloo ..	1,175	50	19	19½ SE.	.. {	Included in Burbheer.	"
70	Karecana ..	3,544	155	322	19½ S.	4 {	"	
71	Kercea Mota of Ranpoor ..	2,187	308	107	18 NW.	3	1,200 0 0	"
72	Kercea Nana { Incl. in Malunpoor. }	..	..	12	W.	.. {	Included in Malunpoor.	
73	Kadeepoor ..	5,923	471	183	15 E.	4	1,051 0 0	"
74	Kumeedhana ..	1,460	272	110	15 S.	2	158 8 0	
75	Khurur. ..	30,562	936	316	4½ S.	14	1,784 0 0	"
76	Khusta. ..	7,053	448	190	4½ NE.	3	2,150 0 0	
77	Kotra ..	2,427	287	89	3 W.	1	801 0 0	"
78	Kotreea ..	2,946	198	53	3 S.	2	843 0 0	
79	Kasundra { Incl. in Gaumph. }	208	83	12	E.	.. {	Included in Gaumph.	"
80	Dhursuleca ..	1,349	..	10½	NE.	..	..
81	Kupurecalee ..	1,840	120	27	16½ S.	.. {	Included in Ullaoo.	Inamee. Talooka.
82	Kancear ..	5,623	199	19	21 NE.	2 {	Included in Botund.	
83	Khankhoce ..	896	21	6	25½ NE.	..	"	"
84	Kercea, near Palce	1,246	241	89	24 S.	1 {	Included in Burbheer.	
85	Kercea, near Loondra ..	1,366	150	59	21 S.	2	"	"
86	Khuo ..	11,736	1,531	459	15 NE.	16	6,304 3 6	
87	Khojapoor ..	1,163	56	17	18 W.	..	125 0 0	"
88	Kokunces ..	4,290	508	186	15 W.	10	1,700 0 0	
89	Koondlee ..	2,975	302	51	19½ NE.	4	750 0 0	"
90	Kunara. ..	1,798	51	14	13½ W.	..	650 0 0	
91	Latherdur ..	5,466	698	272	21 NE.	8 {	Included in Burbheer.	"
92	Loondhura ..	4,018	372	146	21 S.	2 {	"	
93	Lorech ..	4,018	372	146	24 W.	5	1,000 0 0	"
94	Mignelpoor { Incl. in Burwalee }	..	..	13	S.	.. {	Included in Burwalee.	
95	Mandveepoor ..	5,971	721	311	25½ SE.	..	277 13 11	Khalsa. Talooka.
96	Meetheepoor ..	19,275	183	94	15½ N.	4 {	Included in Khudal.	
97	Malpoor ..	1,190	111	62	19½ SE.	2	302 0 0	"
98	Muldhurace ..	982	284	225	24 S.	2	325 0 0	

No.	Names of Villages.	Total Area.	Male Population 1st January 1848.	Number of Houses.	Distance from Dhundooka.	Shops.	Revenue.	Tenure.
		Acres.			Miles.		Rs. a. p.	
99	Malunpoor ..	2,190	95	48	12 W.	4	6,450 0 0	Talooka.
100	Matra Nana ..	562	117	46	36 SW.	..	174 0 0	"
101	Moreseea ..	1,418	69	46	6 W.	1	800 0 0	"
102	Nangulpoor ..	1,633	252	98	22 SW.	2	600 0 0	"
103	Nawuro ..	14,761	773	358	12 S.	9	1,400 0 0	"
104	Nubhoe ..	4,596	90	44	9 S.	..	650 0 0	"
105	Nagurka ..	6,266	773	297	22 $\frac{1}{2}$ NW.	12	851 0 0	"
106	Neenama ..	6,493	222	75	37 $\frac{1}{2}$ SW.	2	400 0 0	"
107	Nolce ..	12,628	411	142	26 $\frac{1}{4}$ W.	8	2,501 0 0	"
108	Nudala ..	4,095	604	131	30 W.	8	1,225 0 0	"
109	Oochudee ..	7,088	857	304	7 $\frac{1}{2}$ S.	5	749 11 0	"
110	Oochulwas ..	285	14	4	21 S.	..	{ Included in Burbheer. }	"
111	Oomrolla ..	6,619	453	130	19 $\frac{1}{2}$ W.	2	1,200 0 0	"
112	Oolaria ..	3,913	343	199	12 SE.	3	1,630 0 0	"
113	Oree ..	4,186	71	30	37 $\frac{1}{2}$ SW.	1	300 0 0	"
114	Pheydra ..	10,618	720	241	10 $\frac{1}{2}$ SW.	5	1,200 0 0	"
115	Panch Taloree.	2,308	..	..	7 $\frac{1}{2}$ S.	..	{ Included in Khudal. }	"
116	Peepul ..	2,490	451	190	7 $\frac{1}{2}$ SW.	2	"	"
117	Patce ..	1,580	210	53	27 SW.	1	{ Included in Burbheer. }	"
118	Petna ..	2,631	119	37	21 S.	1	745 0 0	"
119	Pudana ..	4,702	442	364	3 SW.	..	{ Included in Gaumph. }	"
120	Panchee, & Poora.	1,019	242	77	16 $\frac{1}{2}$ SE.	3	401 0 0	"
121	Panoee ..	4,356	306	151	19 $\frac{1}{2}$ S.	3	830 0 0	"
122	Peeplee ..	16,624	1,338	637	15 NE.	20	2,794 0 0	"
123	Purnhree ..	2,934	328	172	7 $\frac{1}{2}$ S.	3	1,101 0 0	"
124	Palurpoor ..	4,251	687	314	10 $\frac{1}{2}$ S.	28	..	Inancee.
125	Pandnee ..	2,262	245	62	16 $\frac{1}{2}$ SW.	1	{ Included in Ullao. }	Talooka.
126	Palna ..	4,302	783	341	10 $\frac{1}{2}$ W.	6	{ Included in Burbheer. }	"
127	Ranpooree ..	1,842	262	107	10 $\frac{1}{2}$ S.	2	{ Included in Khudal. }	"
128	Refra ..	2,399	118	51	19 SW.	2	"	"
129	Rojed ..	7,454	747	130	12 S.	12	"	"
130	Ruttonwao ..	970	237	106	24 $\frac{1}{4}$ SW.	1	{ Included in Burbheer. }	"
131	Raeeka ..	5,209	299	155	3 N.	1	2,000 0 0	"
132	Rojka ..	14,048	1,742	814	3 E.	18	5,935 0 0	"
133	Rampoora ..	3,053	134	53	18 S.	1	{ Included in Khudal. }	"
134	Ranpoor Kusba.	7,599	4,438	1,471	15 W.	58	3,557 13 7	Khalsa.
135	Rajpoora Botund.	1,937	307	81	15 SW.	1	{ Included in Botund. }	Talooka.

No.	Names of Villages.	Total Area.	Male Population 1st January 1848.	Number of Houses.	Distance from Dhundooka.	Shops.	Revenue.	Tenure.
		Acres.			Miles.		<i>Rs. a. p.</i>	
136	Rajpoora ..	2,198	214	70	25 $\frac{1}{2}$ SW.	2	800 0 0	Talooka.
137	Ranpoora ..	..	45	18	10 SE.	.. {	Included in Gaumph.	"
138	Sodhee. . .	19,326	211	95	10 $\frac{1}{2}$ SE.	.. {	1,788 1 4	Khalsa.
139	Saliugpoor ..	3,922	655	216	18 SW.	4	325 0 0	Talooka.
140	Somdurecana ..	10,415	1,063	446	10 $\frac{1}{2}$ SW.	14 {	Included in Khudal.	"
141	Surwal. . .	3,254	434	177	4 $\frac{1}{2}$ N.	5	"	"
142	Sertulee ..	1,563	143	41	18 SW.	.. {	Included in Burbheer.	"
143	Sujelee ..	682	..	..	18 SW.	..	"	"
144	Summundecala							
	Golanano ..	3,291	273	83	19 $\frac{1}{2}$ SW.	2	"	"
145	Surnaec. . .	3,944	314	118	22 $\frac{1}{2}$ SW.	3	"	"
146	Summundecala. .	898	96	28	7 $\frac{1}{2}$ SW.	..	415 0 0	"
147	Sangasur ..	5,877	129	62	12 SE.	2	130 5 9	"
148	Shahpoor ..	1,365	126	58	10 $\frac{1}{2}$ S.	..	102 6 10	"
149	Sandhera ..	5,909	156	89	13 $\frac{1}{2}$ SE.	1 {	Included in Ootarcea.	"
150	Surwancea ..	1,195	72	29	22 $\frac{1}{2}$ SW.	.. {	Included in Botund.	"
151	Shekhpoor ..	..	..	..	19 $\frac{1}{2}$ W.	.. {	Included in Malunpoor.	"
152	Salosur. . .	1,672	200	70	7 SW.	..	900 0 0	"
153	Sangoce ..	2,604	181	76	7 SW.	2	350 0 0	"
154	Sangunpoor ..	2,925	233	88	19 $\frac{1}{2}$ W.	3	500 0 0	"
155	Shekhrol ..	408	110	29	37 $\frac{1}{2}$ SW.	..	159 14 7	"
156	Summundecala } Jussolbacenoo. }	2,104	344	113	33 SW.	4 {	Included in Burbheer.	"
157	Summundecala, under Ranpoora ..	2,708	457	119	36 SW.	3	950 0 0	"
158	Tajpoor ..	1,840	217	77	36 SW.	2 {	Included in Burbheer.	"
159	Teemla. . .	706	16	5	15 SW.	..	101 0 0	"
160	Trarcea Mota ..	4,701	570	134	10 $\frac{1}{2}$ NW.	5	700 0 0	"
161	Trarcea Nana ..	1,796	75	16	10 $\frac{1}{2}$ S.	..	305 0 0	"
162	Tugree. . .	4,250	665	292	6 S.	9	3,001 0 0	"
163	Toorka. . .	4,014	688	227	25 $\frac{1}{2}$ SW.	2 {	Included in Botund.	"
164	Udmal. . .	10,766	1,628	711	4 $\frac{1}{2}$ N.	28	4,000 0 0	"
165	Uncealee ..	6,181	845	340	18 SW.	11	3,260 0 0	"
166	Ullao ..	10,092	741	214	6 SW.	11	730 4 9	"
167	Uncealee Ka- thenee ..	3,209	237	70	19 $\frac{1}{2}$ SW.	1	800 0 0	"
168	Uncealee Kus- batee. . .	2,308	194	36	16 $\frac{1}{2}$ W.	3	923 0 0	"

No.	Names of Villages.	Total Area.	Male Population 1st January 1848.	Number of Houses.	Distance from Dhundooka.	Shops.	Revenue.	Tenure.
		Acres.			Miles.		<i>Rs. a. p.</i>	
169	Wuheea ..	1,962	89	31	13½ SW.	1	{ Included in Khudal. }	{ Talooka. }
170	Wejulka ..	3,182	374	174	10½ SW.	3		
171	Weerde ..	558	39	13	22 S.	2	{ Included in Burbhoer. }	{ " }
172	Welawudder ..	264	..	..	22½ SE.	..		
173	Wujelee ..	1,687	167	47	18 SW.	2	"	"
174	Waoree Motee ..	6,969	473	136	12¾ SW.	5	{ Included in Malunpoor. }	{ " }
175	Waoree Nance ..	3,477	306	114	15¾ SW.	..		
176	Wadhela ..	9,458	355	163	15 W.	3	Included in Ullaoo.	"
177	Wagur ..	4,861	1,093	279	7½ W.	16	2,721 " 0 0	"

GOGO PURGUNNA.

No.	Names of Villages.	Total Area.	Male Population 1st January 1848.	Number of Houses.	Distance from Gogo.	Shops.	Revenue.	Tenure.
		Acres.			Miles.		<i>Rs. a. p.</i>	
1	Alapoor	{ Bhownuggur Talooka. }	21	6	4½ S.	..	{ Included in Wurwa. }	{ Talooka. }
2	Amundpoora		..	..	18 SW.	..	75 0 0	"
3	Bhekra. .	2,405	520	182	12 W.	5	1,176 11 1	Khalsa.
4	Bordee. .	{ Blownuggur Talooka. }	148	40	21 W.	..	{ Included in Wurwa. }	{ Talooka. }
5	Bordel ..		640	191	6 W.	9	"	"
6	Bhoomlee ..		1,496	17	3 W.	17	"	"
7	Bhoolesur ..		232	65	4½ W.	..	"	"
8	Bheswuree ..		..	..	10½ S.	..	"	"
9	Burbureeco ..		70	12	6 S.	..	"	"
10	Bhuree. .		138	37	13½ SW.	..	"	"
11	Bharolee ..		410	113	16½ SW.	2	"	"
12	Buparoo ..		207	61	19½ S.	2	"	"
13	Baree ..		339	106	6 SW.	4	312 0 0	"
14	Bhuwaneepoora ..	927	55	17	10½ S.	..	300 0 0	"
15	Bamuneea ..	606	61	22	13½ SW.	..	75 0 0	"
16	Burdlee ..	964	226	60	19½ W.	1	200 0 0	"
17	Bholad ..	546	217	48	18 NW.	..	275 0 0	"

No.	Names of Villages.	Total Area.	Male Population 1st January 1848.	Number of Houses.	Distance from Gogo.	Shops.	Revenue.	Tenure.
		Acres.			Miles.		Rs. a. p.	
18	Bhojpoora ..	1,706	487	150	18 NW.	8	606 0 0	Talooka.
19	Bhankhel ..	1,996	264	78	18 S.	3	355 0 0	"
20	Bhundar ..	365	42	9	13½ W.	..	80 0 0	"
21	Bhundareeco	Bhow-nuggur Talooka.	1,068	301	13½ SW.	11	Included in Wurwa.	"
22	Chooree		118	35	18 SW.	1		"
23	Chunecaloo ..		823	177	49 16½ S.	..		"
24	Chayah ...		763	103	30 12 S.	..		"
25	Cheetra ..		2,424	128	40 12 NW.	..		Inamee.
26	Doogunah	Bhow-nuggur Talooka.	782	183	18 W.	14	..	Talooka.
27	Dharooka ..		355	90	28 21 W.	..	90 0 0	"
28	Furcadka	Bhow-nuggur Talooka.	446	115	13½ W.	1	..	Inamee.
29	Gogo Kusba ..	2,625	7,717	2,533	{ Dist. from Ahmedabad 108 S. }	102	121 2 1	Khalsa.
30	Ganglee	Bhow-nuggur Talooka.	1,760	193	22 NW.	4	Included in Wurwa.	Talooka.
31	Goondie		294	74	4½ SE.	1		
32	Gooreealee ..		1,675	57	18 15 S.	..		
33	Gureebpoora ..	1,498	145	40	15 S.	1	250 0 0	"
34	Hathub	Bhow-nuggur Talooka.	802	229	6 SE.	8	Included in Wurwa.	"
35	Jabulloo		190	34	21 W.	1		
36	Juspoora		655	155	15 SE.	11		
37	Joonapadur ..	576	67	19	9 W.	..	250 0 0	"
38	Jallea Joon ..	705	80	24	19½ W.	..	95 0 0	"
39	Jallea Nuwa ..	385	104	27	21 W.	..	55 0 0	"
40	Jheenjur	Bhow-nuggur Talooka.	..	..	7½ NW.	..	Included in Wurwa.	"
41	Khokra Mota ..	3,524	568	206	15 W.	9		
42	Kurera ..	3,528	341	116	6 SW.	2		Khalsa.
43	Kajawaddur ..	Bhow-nuggur Talooka.	242	64	21 W.	2	Included in Wurwa.	Talooka.
44	Kuchotcea ..		..	..	21 W.	..		
45	Kurdej ..		695	115	16½ SE.	6		
46	Khakureea ..		166	39	18 W.	..	"	"
47	Kabree ...		247	65	9 SW.	1	"	"
48	Koleeale ..		982	236	6 SE.	33	"	"
49	Khudurpoor, or Meteewurdee..		688	194	12 SE.	9	"	"
50	Khursulea ..		618	126	7½ S.	7	"	"
51	Khurnumdees ..		38	9	15 W.	..	"	"
52	Khantree ..		192	62	13½ W.	1	"	"
53	Kunkote ..	693	78	18	10½ W.	..	230 0 0	"
54	Khokra Nana ..	1,175	402	93	13½ W.	2	600 0 0	"
55	Koorah ..	2,115	421	117	4½ SE.	3	230 0 0	"

No.	Names of Villages.	Total Area.	Male Population 1st January 1848.	Number of Houses.	Distance from Gango.	Shops.	Revenue.	Tal. or.
		Acres.			Miles.		Rs. a. p.	
56	Kookur ..	2,118	651	165 13 $\frac{1}{2}$	S.	7	700 0 0	Talooka.
57	Kuntala ..	358	209	50 15	S.	1	120 0 0	"
58	Kumbij ..	1,725	681	169 15 $\frac{1}{2}$	SE.	5	725 0 0	"
59	Khambha ..	500	61	22 21	W.	..	165 0 0	"
60	Kumar ..	1,975	365	91 21	W.	2	250 0 0	"
61	Kharree ..	620	213	68 21	W.	1	200 0 0	"
62	Kanee ..	{ Bhownagar Talooka }	..	.. 13 $\frac{1}{2}$	NW.	..	..	Inanee.
63	Kharke ..	1,116	571	151 15	W.	7	..	"
64	Lakenka ..	{ Bhownagar Talooka }	105	32 9	W.	..	100 0 0	Talooka.
65	Lakree ..	2,372	397	100 18	SE.	4	575 0 0	"
66	Lakenka ..	966	811	99 10 $\frac{1}{2}$	SE.	1	Included in Wurwa.	"
67	Megwudder ..	{ Bhownagar Talooka }	81	21 21	W.	..	"	"
68	Malenka ..	{ Bhownagar Talooka }	211	60 7 $\frac{1}{2}$	NW.	3	"	"
69	Mandwa ..	201	19	13 $\frac{1}{2}$	SE.	..	"	"
70	Malpoor ..	2,193	292	85 6	W.	1	535 0 0	"
71	Mansa ..	399	31	11 7 $\frac{1}{2}$	W.	..	130 0 0	"
72	Morchund ..	3,008	687	178 9	S.	2	900 0 0	"
73	Mogla ..	1,009	137	37 22 $\frac{1}{2}$	NW.	..	275 0 0	"
74	Mulekwudder ..	761	91	23 1 $\frac{1}{2}$	S.	..	150 0 0	"
75	Neera ..	{ Bhownagar Talooka }	587	111 18	NW.	1	Included in Wurwa.	"
76	Naree ..	{ Bhownagar Talooka }	995	215 15	NW.	2	"	"
77	Nagdureemha ..	230	69	7 $\frac{1}{2}$	SW.	1	"	"
78	Nawagaum Mota ..	1,333	362	81 21	NW.	2	625 0 0	"
79	Nuwagaum Nana ..	1,769	227	55 15	S.	1	260 0 0	"
80	Neswar ..	573	61	12 10 $\frac{1}{2}$	W.	..	250 0 0	"
81	Oosur ..	{ Bhownagar Talooka }	118	107 21	W.	1	Included in Wurwa.	"
82	Oduka ..	1,003	267	69 13 $\frac{1}{2}$	S.	1	280 0 0	"
83	Ookhuila ..	2,336	583	189 9	SW.	8	1,200 0 0	"
84	Oorvee ..	751	317	72 19 $\frac{1}{2}$	NW.	3	360 0 0	"
85	Oocedhur ..	1,785	316	82 1 $\frac{1}{2}$	S.	3	..	Inanee.
86	Phoolsur ..	{ Bhownagar Talooka }	31	13 13 $\frac{1}{2}$	NW.	..	Included in Wurwa.	Talooka.
87	Pancealee ..	{ Bhownagar Talooka }	300	80 13 $\frac{1}{2}$	S.	2	"	"
88	Panchpeeplee ..	{ Bhownagar Talooka }	150	56 18	SW.	1	"	"
89	Pethulpoor ..	{ Bhownagar Talooka }	38	13 12	S.	..	"	"
90	Pancealoo ..	413	87	31 16 $\frac{1}{2}$	W.	..	125 0 0	"
91	Pethulpoor ..	617	38	12 6	W.	..	175 0 0	"
92	Purma ..	2,511	491	119 6	S.	7	100 0 0	"
93	Peepula ..	590	186	48 15	W.	1	150 0 0	"
94	Palree Turk ..	{ Bhownagar Talooka }	221	25 16 $\frac{1}{2}$	W.	1	Included in Wurwa.	"

No.	Names of Villages.	Total Area.	Male Population 1st January 1848.	Number of Houses.	Distance from Gogo.	Shops.	Revenue.	Tenure.
		Acres.			Miles.		<i>Rs. a. p.</i>	
95.	Ruttonpoor (near Tanna) ..	} Tal. Cha. } Tal. Cha. } Tal. Cha. } Tal. Cha. } Tal. Cha.	3	121	W.	..	{ Included in Wurwa. 238 0 0	{ Talooka.
96.	Rajpoora ..		123	31	18 W.	..		
97.	Roocha ..		119	33	9 NW.	..	{ Included in Wurwa.	{ "
98.	Rampoor ..		136	13	3 W.	..		
99.	Ruttonpoor Joo- noo ..		112	31	3 S.	..	"	"
100.	Ruttonpoor Nu- woo ..	} Tal. Cha. } Tal. Cha. } Tal. Cha. } Tal. Cha. } Tal. Cha.	355	91	3 S.	6	"	"
101.	Rajpoora ..		221	43	16 $\frac{1}{2}$ SW.	..	"	"
102.	Rajpoora ..		500	145	6 W.	4	"	"
103.	Rubareeka ..		528	72	21 19 $\frac{1}{2}$ W.	..	"	"
104.	Sechor ..		5,611	1,691	21 W.	47	"	"
105.	Seeroroo ..	} Tal. Cha. } Tal. Cha. } Tal. Cha. } Tal. Cha. } Tal. Cha.	..	..	16 $\frac{1}{2}$ NW.	..	"	"
106.	Soorka ..		458	111	24 W.	..	"	"
107.	Soork ..		71	23	3 S.	3	"	"
108.	Surtanpoora ..		332	100	7 $\frac{1}{2}$ S.	1	"	"
109.	Sankra-seer ..		238	16	16 $\frac{1}{2}$ SW.	1	"	"
110.	Soseca ..	} Tal. Cha. } Tal. Cha. } Tal. Cha. } Tal. Cha. } Tal. Cha.	230	59	16 $\frac{1}{2}$ SE.	2	"	"
111.	Sanodur ..		1,909	1,053	509 10 $\frac{1}{2}$ SW.	8	1,600 0 0	"
112.	Shampoon ..		1,006	120	31 16 $\frac{1}{2}$ NW.	..	"	Inamee.
113.	Schoowaddur ..		855	209	53 21 W.	..	200 0 0	Talooka.
114.	Seer ..		590	128	29 21 W.	..	100 0 0	"
115.	Summundecala ..	} Tal. Cha. } Tal. Cha. } Tal. Cha. } Tal. Cha. } Tal. Cha.	850	..	12 W.	110	140 0 0	"
116.	Sarwadder ..		910	71	23 15 SW.	..	300 0 0	"
117.	Seed-sur ..		407	121	10 $\frac{1}{2}$ NW.	4	..	Inamee.
118.	Serawuddar ..		58	15	3 $\frac{1}{2}$ NW.	..	..	"
119.	Shampoor ..		235	37	12 NW.	3	350 0 0	Talooka.
120.	Sorwaddaroo ..	} Tal. Cha. } Tal. Cha. } Tal. Cha. } Tal. Cha. } Tal. Cha.	131	33	13 $\frac{1}{2}$ NW.	..	..	Inamee.
121.	Tanna ..		1,477	359	22 $\frac{1}{2}$ W.	31	{ Included in Wurwa.	{ Talooka.
122.	Tursurees ..		294	111	7 $\frac{1}{2}$ NW.	5		
123.	Thulsur ..		311	72	9 SE.	2	"	"
124.	Trapuj ..		1,128	328	18 S.	26	"	"
125.	Thordec ..		418	147	1 $\frac{1}{2}$ W.	1	"	"
126.	Tuggee ..	} Tal. Cha. } Tal. Cha. } Tal. Cha. } Tal. Cha. } Tal. Cha.	987	177	65 6 W.	2	535 0 0	"
127.	Tuarbuck ..		726	146	45 10 $\frac{1}{2}$ SW.	..	400 0 0	"
128.	Tamusah ..		4,731	1,201	342 15 SW.	13	5 0 0	Inamee.
129.	Unjealoo ..		451	111	16 $\frac{1}{2}$ W.	6	{ Included in Wurwa.	{ Talooka.
130.	Ukwaroo ..		310	109	7 $\frac{1}{2}$ NW.	1		
131.	Udbewaroo ..		137	141	7 $\frac{1}{2}$ NW.	5	{ Included in Wurwa.	{ "
132.	Umancea ..		4,535	602	176 6 NW.	3		
133.	Waorce. .	} Tal. Cha. } Tal. Cha.	4,085	511	178 7 $\frac{1}{2}$ W.	5	1,025 0 0	"

No.	Names of Villages.	Total Area.	Male Population 1st January 1848.	Number of Houses.	Distance from G. G.	Shops	Revenue.	Tenure.
		Acres.			Miles.		<i>Rs. a. p.</i>	
134	Wulawur ..	<div style="display: inline-block; vertical-align: middle;"> <div style="display: inline-block; vertical-align: middle;">The Town of Bhow- nuggur in the land of the village.</div> <div style="display: inline-block; vertical-align: middle; font-size: 2em;">}</div> <div style="display: inline-block; vertical-align: middle;">Bhownuggur Talooka.</div> </div>	175	37 24	W.	..	Included in } Wurwa. }	Talooka.
135	Wureeoo ..		491	122 22½	W.	2		
136	Wurwa ..		1,930	446 10½	NW.	11	21,500 0 0	..
137	Waoree ..		165	51 13½	S.	..	..	..
138	Walookur ..		3,619	1,269	W.	21	3,401 0 0	..
139	Wurtej . . .	<div style="display: inline-block; vertical-align: middle;"> <div style="display: inline-block; vertical-align: middle;">Bhow- nuggur Talooka.</div> <div style="display: inline-block; vertical-align: middle; font-size: 2em;">}</div> </div>	1,519	426 15	NW.	19	..	Inamee.

[NOTE.—The area of the villages under Bhownuggur is not known, nor the population of the town. The revenue of the whole talooka of the Bhownuggur Thakore in the Gogo purgunna is given under Warwa.]

SITUATION, AND GENERAL DESCRIPTION.

The chief city in the Ahmedabad Collectorate is Ahmedabad : it is situated in N. latitude 23° 1', and E. longitude 72° 42'. It does not boast great antiquity, having been founded by Sultan Ahmed in the year A. D. 1411, according to the Mirati Ahmedi (a history of Ahmedabad), a Persian work written about a century ago by Mahomed Ali Khan, the Padshahie Dewan of Ahmedabad. There are many fine mosques and tombs, beautifully ornamented, still standing as a monument of its former greatness. The city of Ahmedabad is surrounded with a good wall, averaging about 15 feet in height and 4 to 5 feet thickness, with occasional bastions and gateways. It is not, however, a fortified town; the wall is merely intended for the security of the city against robbers, who formerly were very numerous and daring, venturing even to make sudden attacks on this large place. The old walls were in a very dilapidated state; and in A. D. 1831 a regulation was passed, providing funds for the repair of them. The wall in length measures 5 miles, 6 furlongs, and 28 poles. This work was completed in A. D. 1843, when the people agreed to continue the fund for municipal purposes. By this means roads are being made and watered, and lighted at night. Arrangements are also in hand for a good supply of water from the river by means of an aqueduct. A town clock is about to be erected, and an establishment of fire-engines maintained, as soon as they are received from England.

Dholka is situated 22 miles to SW. by S. of Ahmedabad. It is said to be

the most ancient town in this part ; but no authentic account of its early days is known to exist. It is an open town, and has several fine stone-built tanks and mosques, but somewhat delapidated. They are of the time of the Mahomedan dynasty. The limits of the town extend to 1 mile, 1 furlong, 10 poles in length, and 6 furlongs 93 yards in breadth.

Veerungaum is a walled town. Upon the British accession the wall was in a very delapidated state, and the Government permitted the proceeds of a tax called gullalputtee to be applied to its repair, and it has accordingly been put into a good state, quite sufficient to repel any casual attack of banditti. The town is 5 furlongs 100 yards in length, and 3 furlongs 170 yards in breadth.

The town of Veerungaum is situated 38 miles W. by N. of Ahmedabad, and is the head quarters of a Mauludhar or Native Collector, who has 170 villages under his charge, which comprise the whole of this purgunna. A description of the town of Veerungaum is given in the Revenue Survey Report dated 31st October 1827, as follows :—

“This is a town of comparative modern date, and did not exist as a place of any consequence until the time of the Mussulmans. Its situation in a military point of view is a good one, as commanding the entrance into Kattiawar ; and on this account, probably, it was chosen as the station of the officer subordinate to the Soubehdar of Ahmedabad, under whose charge the district of Jhalawar was placed, and of which it consequently became the capital.”

Para. 59. “The town of Veerungaum stands within a few miles of the edge of the Runn, in the midst of an extensive bare plain. It is encompassed with a brick wall upon a stone foundation, flanked with the usual proportion of towers, and including a circumference of 2 miles and 1 furlong. In the north-east corner there is a small fortified enclosure, intended as a citadel, but the interior wall of the town itself forms two of its faces. The ruinous state of the wall having attracted the notice of Government, and it being considered advisable in this wild and often distracted country to preserve it in good repair, the town taxes called gullalputtee have, since the accession of the Company’s rule, been allowed to accumulate as a fund for its repairs, and the renovation of such parts as are most in decay is at present in progress.”

Mr. Jackson, in his Jumnabundy Report for 1834-35, paragraph 55, dated 28th September 1835, alludes to the improved state of Veerungaum kusba :—“The kusba of Veerungaum is the most thriving town in the whole of this zillah. Since my visiting it in A. D. 1826, very considerable improvement has taken place ; the population has been on the increase, and the number of substantial and very neat houses that have sprung up in every direction is really surprising. This state of things may be attributed to the security which is felt by the inhabitants, consequent on the rebuilding of the walls of Veerungaum, as well as to this place being situated on the high road to Kattiawar and Jhalawar, as also on that leading to the bunders of Dholera, Blownuggur, and Gogo, from Marwar.”

The following is an account of Veerungaum translated from a Persian work called *Mirati Ahmedi* :—"The seat of the Government in former time was at Mandul [14½ miles north of Veerungaum]. Veerungaum was an open town then, and it was in the time of Firdoz Aramgah, [this is said to be one of the titles of Shah Jehan,] when the country was liable to depredations of banditti, that the Desaee of Veerungaum commenced building the fort all around the town. The Zumeendars were very powerful, and used to have intercourse with the Kattees, who were at that period great robbers and highwaymen. The revenue of the Veerungaum purgunna used to be exacted by sending a force against the place. The revenue of Veerungaum was, by order from Delhi, made the salary of the Soubehdar of Guzerat, and it became the interest of the Governor to levy money by any means in his power; and if the collections exceeded the fixed salary, the overplus was credited to the royal revenue. Veerungaum is stated to have had 629 villages, of which 105 were under Zumeendars, and 523 were khalsa." The revenue of the salt-pans and customs, &c. amounted to 2,38,61,881 dams. There were then three thanas or outposts, viz. Kurrce, Shapoor, and Choorā Ranpoor. Of these only Shapoor is under the Veerungaum jurisdiction now; the others are in the hands of foreign States. No further particulars are given about Veerungaum, as it formed the salary of the Soubehdaree of Guzerat. Forty dams are equal to one rupee of our present currency.

The town of Gogo is walled, except upon the sea face. Voluntary municipal collections are made here for the purpose of repairing the wall, &c. Roads are in the course of construction in the town, and improvement in other respects to the bunder and sea face of the town, and the clearing of a fine tank in the neighbourhood is likely soon to be carried into effect. The proper name of this place is Ghogha (घोगा), but the spelling Gogo being so commonly known is retained.

The town of Dholera has only lately become of importance. From a mere village in a desolate plain, it now numbers 6,807 inhabitants, and most of the trade of the country to the northward passes through it, on the way to the port of Khoon or Bhowleearee. It labours under a severe natural disadvantage, the want of good water, and is at present dependent on a tank, the water of which is far from good. The construction of another has lately been sanctioned, but, from the nature of the soil, it is almost impossible that they should be otherwise than dependent on the quantity of rain falling in the monsoon; for, if the tanks are deepened beyond a few feet, springs of brackish water are met with, which of course would spoil the supply of rain water if tapped. Not long ago there was scarcely a substantial house in the place, but such are now appearing; one or two handsome temples are being built, and neatly finished. A sort of municipal fund is raised here under the name of *dhurum tulao*, having for its object the keeping in repair of the tanks on the roads in this arid part of the district. The committee of management have lately consented to an enlargement of its object, by voting that the funds may

be applied to building a bridge over the Bhogawa between Dholera and Ahmedabad.

The town of Bhownggur, which belongs to the Thakore of that title, is a walled town, of no strength in a military point of view, and the walls in some parts are out of repair. It is a place of considerable trade. The creek, which comes to within a mile of it, has deep water in it, so as to admit of the passage of vessels of considerable size even at low water.

The town of Patree is walled, and has a fort inside of some strength; but it is somewhat delapidated. The main walls of this latter are built of stone, and in tolerably good order. The Thakore of this title lives in the fort. The town is not large, the male population being only 2,295. The Thakore enjoys the revenue of 12 villages in inam, and he is also hereditary Desae of the Dhundooka purgunna.

POPULATION.

The following tables give the population according to the census of 1846, but, with the exception of the city of Ahmedabad, further corrections have been made up to 1st January 1848:—

Statement of Population, Houses, Births, and Deaths, from 1st January to 31st December 1847, according to the Returns sent to the Collector by the various Local Officers.—1st January 1848.

Names of Mahals.	POPULATION.		HOUSES.				BIRTHS.		DEATHS.		Deaths per Cent. of Po- pulation.	Births per Cent. of Po- pulation.	Number of Inhabitants per Square Mile.			
	Males.	Females.	Total.	Tiled.	Terraced.	Thatched.	Total.	Males.	Females.	Total.						
DuskrohieAhmedabad	41,056	28,591	69,647	15,151	1	6,827	21,979	1,784	1,315	3,129	1,709	1,199	2,908	4	4	238½
Dholka	62,265	47,940	110,205	10,086	53	5,565	45,704	1,150	833	1,983	1,285	859	2,144	2	2	120½
Veerungaum	41,394	30,638	72,032	21,902	4	5,594	27,500	1,251	1,054	2,305	1,142	785	1,927	3	2	93½
Dhundooka	50,955	40,451	90,536	31,309	3	4,033	35,345	1,521	1,411	2,935	1,358	980	2,338	2½	2	68½
Puranteje	36,129	26,621	63,650	9,607	..	9,832	19,439	1,531	1,173	2,704	990	787	1,777	4	2	139
Duskrohie Jetulpoor..	23,334	17,197	40,831	10,141½	..	3,717½	13,862	1,231	1,356	2,587	926	696	1,622	4½	4	254½
Gogo	32,968	27,393	60,361	16,018	27	978	17,023	1,207	1,048	2,255	786	601	1,387	3	1½	124½
City of Ahmedabad .	45,723	45,501	91,224	31,536	2	784	32,322	939	778	1,717	1,796	2,019	3,815	1½	4	40,725
Total...	333,254	264,632	597,886	17,575	90	37,330	213,174	10,617	8,998	19,615	9,992	7,926	17,918	3½	2½	39½

EMPLOYMENT.

The majority of the inhabitants of this zillah are cultivators ; for the rest employment may be said to be hereditary, the same trade being handed down from father to son, according to the caste system.

Weaving is at present very little resorted to as an employment to what it used to be, owing to the large importation of English cloths, which almost entirely superseded the Native manufacture, except dongaree of coarse description. Ordinary and finer kinds of cloth can be bought cheaper as imported than they can be made here, notwithstanding the very low rate of wages.

LANGUAGES.

The language chiefly spoken is the Guzerattee dialect, but in the towns the Oordoo or Hindoostanee is generally understood. The dialect varies a good deal in different parts of this zillah, and also in pronunciation, so that country people of the southern hardly understand those of the northern parts. There is, however, very little variation in writing, so that the same letter would be easily understood in either direction.

The mode in which the Banyans write is generally very uncertain in meaning, from the almost total discarding of vowels, and leaving no space between words.

CONDITION.

The condition of the people is, as I am informed by respectable inhabitants of the city, much improved since the late Mahratta Government. In those times a wealthy man was not known by his dress, carriage, or appearance ; and if a person attempted to show his wealth, he was very soon under some pretext or other deprived of it. The habits which this produced are now wearing off, and the wealthy of the city have many of them set up carriages, and several have built country houses, and enjoy themselves in the ease and comfort which characterizes a peaceful and civilized people. The Native Hindoo population are undoubtedly in better circumstances than the Mahomedans. There are a few wealthy Mussulmans, who trade in silk and piece goods, but the majority of Mussulmans seek for employment as peons and weavers, or as labourers. They will not permit their women to stir out of doors to assist them in earning a livelihood, and their time is spent in spinning cotton thread, earning a poor pittance of about one pice for the day's work. The manufacture of thread in England has materially tended to depress the condition of the poorer classes, so that they earn a very precarious livelihood. At the present time it is far cheaper to get English yarn or longcloth than to get the thread and coarse cloth the manufacture of the country. The Native looms are now used for working on such cloth as is suited to the poorer classes. The trade in kincob (brocade), for which Ahmedabad used to be famous, has much fallen off ; but I am not able to say to what extent.

EDUCATION, AND METHOD OF PURSUING IT.

A common educational course for a Hindoo at a Native school is as follows; the information has been obtained from Jeewunlal Takurlal, a Karkoon in the Huzoor Cutcherry:—

A child is sent to the school at six or seven years of age. On first entering school, a *douceur* of one rupee is given to the Mehtajee or schoolmaster, and the boy is set to count by rote, commencing from 1 to 100. When the boy is perfect, he is set to mark down the numerals on his slate, or sanded board. About two months are thus employed. He is then set to the multiplication table, from 1×1 to 10×10 , and afterwards from 10×10 to 10×40 , 400, &c.

On a boy's entrance into school the Mehtajee receives a fee of Rs. 1 0 0

After learning multiplication to 40×40 , the boy is set to learn a table of multiplication of fractions, *i. e.* $1\frac{1}{2} \times 1\frac{1}{2}$ and $2 \times 1\frac{1}{2}$, to 100.

On this the parents pay a fee of one rupee, and this embraces the whole fractional multiplication from $1\frac{1}{2} \times 1$ to $3\frac{1}{2} \times 1$ to 100. 1 0 0

On the boy being perfect in multiplication, as above stated, he is set to write the Guzerattee alphabet, and pays the first day a fee to the master of 1 0 0

His next lesson is the *nama*, *i. e.* the joining of letters in spelling proper names, on which occasion he pays 0 8 0

He is then put into accounts, and the rule of three, &c. and pays. 0 0 0

Rs. 4 0 0

He reads no books, nor would the school commonly contain a book, or the Mehtajee be able to read one with any fluency.

At this stage the boy is said to have completed his education, and on leaving school a parting fee of one rupee is expected by the schoolmaster. Thus their whole tuition costs them about Rs. 4 or 5, besides a daily present of a handful of grain to the Mehtajee when the boy attends the school, on an average $3\frac{1}{2}$ seers per month. The education is said to be complete in two years, but some boys remain four years, and some five years to perfect themselves in accounts.

The number of schools in this zillah, from information received from the Mamltudar, are as follows, for January 1847 :—

Names of the Mahals.	Number of Schools.	English Schools.	Number of Guzeratee Schools.	Supported by Govern- ment.	Number of Native Private Schools.	Reading Guzeratee.	Persian Schools.	Arabic Schools.	Sanscrit Schools.	Malvatu Schools.
		Pupils.		Pupils.		Pupils.				
Ahmedabad Dus- krohic .....	..	..	..	..	21	505	..	..	..	..
Dholka .....	..	..	1	45	19	911	..	..	..	..
Vecrumgaum .....	..	..	..	..	9	511	..	..	..	..
Dhundooka .....	..	..	1	60	14	389	..	..	..	..
Puranteje .....	..	..	..	..	4	324	..	..	..	..
Jetulpoor Dus- krohic .....	..	..	..	..	15	277	..	..	..	..
Gogo .....	..	..	1	42	18	750	..	..	..	..
City of Ahmedabad.	1	47	2	577	28	3,232	..	2	..	1
Total. . . .	1	17	5	721	131	6,929	..	2	..	1

“The inhabitants of Ahmedabad have particularly distinguished themselves in the exertions they have made to erect a school-house, as they have raised amongst themselves a sum of Rs. 4,397, to which it was only necessary to make a small addition on the part of the Board, of Rs. 257, and the building is now in the course of erection under the superintendence of the Government engineer.” This school was opened on the 1st January 1846, and the following extract shows the Board’s opinion of its progress in their report for the year 1846 :—

Para 66. “When Mr. Green, the Superintendent of the 2nd Division, visited the school at the commencement of the year, it had only been established a month. Mr. Green, however, saw enough to lead him to anticipate very favourably of its future success; and on a visit which our President paid to the school at the commencement of the present year, the zeal of the Master and the earnestness of the principal inhabitants in the cause which they had taken up, bade fair to make this school one of the most promising in the Presidency.”

The number of pupils on the 1st January 1849 was 97. One of the Vernacular schools in Ahmedabad is highly spoken of by the Superintendent of Schools in the report for 1846, page 52 :—

“I have very great pleasure in pointing out for the approbation of the Board, the very flourishing state of the School No. 1 in this town. It is unquestionably at present the best taught Vernacular school in the whole of Guzerat. By reference to the detailed report of the state of the classes, it will be seen that pains are taken with the whole of the school, that grammar and geography are taught lower down in this school than in any others in the Guzerat Division, and that even as far from the head of the school the

3rd class, the pupils were remarked as 'intelligent and well taught boys.' The master has succeeded also in inducing some of his caste people to send their *daughters* to be taught, and four little Nagur Braminees presented themselves in the classes at the examination. I should be much pleased to be made the medium for conveying to the master any expression by which the Board might think fit to mark their sense of his zeal and industry."

CHARITABLE INSTITUTIONS.

There are many private charities established in the Collectorate, under the name of *sudawurut*, which generally consists of daily rations of grain to jesees (astrologers), hyragees, and mendicants, or people proceeding on pilgrimage. Of these there are altogether as follows, according to returns furnished by the several *Manildars* :—

Ahmedabad city.....	1
Duskrohi Ahmedabad	2
Duskrohi Jetulpoor	8
Dholka	16
Puranteje	1
Veerungam	7
Dhundooka.....	57
Gogo	29

In Ahmedabad there is an institution called Sultan Ahmed's Lungur Khana, the origin of which is not exactly known. The Government continue to pay the amount of Rs. 2,894-7-3 per annum, which was found to be in enjoyment at the British accession, and is continued to objects of charity in succession as the pension lapses.

An asylum for the blind and infirm is in contemplation, and subscriptions to a considerable amount have been put down, but final arrangements have not yet been completed. There is a large pinjrapole or institution for animals in Ahmedabad, which is well endowed by voluntary small payments on articles of trade, and the late Hatheesing Kesreesing gave to it half the produce of the village of Mankole in the Dholka purgunna.

STATE OF LITIGATION AND CRIME.

The state of litigation is a subject which can be better treated of by the Judge of the Zillah. I shall therefore pass on to that of crime. This part of the country was formerly in a very disturbed and insecure state, attacks from large gangs of robbers under recognized chiefs being frequent. This state of affairs is now at an end : the robberies and outrages which take place have lost the signs of organization which formerly characterized them, and are now merely caused by desire of private revenge and plunder.

The returns of crimes from this Collectorate were formerly so very inaccurate, that it is impossible to attain a fair comparison now. The return of crime for the last three years gives the following result :—

POLICE: NUMBER, REMUNERATION, AND EFFICIENCY.

The following abstract statement will show the Police force in the Ahmedabad Collectorate of all descriptions:—

	No.	Monthly Cost.		
		Rs.	a.	p.
Kolee Police Corps.....	306	20,412	0	0
Guzerat Irregular Horse..145 }	253	67,086	0	0
Horse Police 108 }				
Peons solely on Police duties. .	529	27,777	0	0
Ditto Police and Revenue.....	201	10,740	0	0
Ditto solely on Revenue duties.	141	7,404	0	0
Jewaidars, &c.....	*1,490	46,941	10	0
Village Puggies	*1,119	21,152	8	10
Rawuneas	*1,133	23,689	11	4
Mookhee Patel, or Police Karbaries	*922	10,879	14	7
Mehwasee, Local Police, Horse and Foot, under Chiefs....	†102	3,420	0	0
		<hr/>		
			2,39,502	12 9

European and Native Assistants employed on Police Duties.

	Monthly Cost.			Annual Cost.		
	Rs.	a.	p.	Rs.	a.	p.
1 Commandant, Guzerat Irregular Horse ..	878	4	0			
1 Second in Command, ditto.....	378	4	0			
1 Adjutant, ditto.....	170	4	0			
1 Commandant, Kolee Police Corps.....	523	10	0			
1 Adjutant, ditto	366	10	0			
Ructwaldar Karkoons						
2 Magisterial ditto } Kolee Police Corps. }	40	0	0			
1 English Writer .. }	20	0	0			
1 Persian Writer.. } Guzerat Irregular }	30	0	0			
1 Mootsudee }	8	0	0			
		<hr/>				
Carried over....	2,415	0	0	28,980	0	0

* Quantity of Land, with the estimated Amount of Revenue in Money.

	Land.		Estimated at			Money Payments.		
	Beegas.	w. ww.	Rs.	a.	p.	Rs.	a.	p.
Jewaidars	61,797	8 12	41,442	10	5	5,498	15	7
Village Puggies	13,326	11 15	20,350	11	2	801	13	8
Rawuneas	14,712	3 19	22,313	7	1	1,376	1	0
Mookhee Patel.....	3,545	13 1	5,458	13	5	5,421	1	2

† The Police Establishment at Bhowanuggur and Patree are paid by the respective Chiefs.

Magistrate's Establishment.

	Monthly Cost.			Annual Cost.		
	<i>Rs.</i>	<i>a.</i>	<i>p.</i>	<i>Rs.</i>	<i>a.</i>	<i>p.</i>
Brought over.....	2,415	0	0	28,980	0	0
English Writer	None.					
5 Karkoons at Rs. 33, Rs. 17-8-0, and two at Rs. 8-8-0 each	79	8	0			
Contingent expenses	23	0	0			

Mahal Establishment.

3 Thanadars at Rs. 28, Rs. 23-8-0, and Rs. 12-8-0	64	0	0			
3 Foujdars, two at Rs. 33 each, and one at Rs. 93-8-0	159	8	0			
6 Karkoons, three at Rs. 12-8-0 each, and three at Rs. 8-8-0	63	0	0			
Contingent expenses	80	4	0			
	<hr/>					
	469	4	0	5,631	0	0
	<hr/>					
Total, Local Corps, &c....	2,74,113	12	0			

Officers exercising Penal Powers in the Zillah.

- 1 Magistrate.
- 2 Assistant Magistrates, Civil Service, one with full powers.
- 1 Magistrate, Military officer.
- 4 Assistant Magistrates, ditto.
- 1 Ditto ditto Medical officer.
- 7 Mamlutdars. (Regulation XII. of 1827, Chap. 5.)
- 3 Joint Police Officers, Kotwal, and Foujdars. (Regulation III. of 1833.)
- 5 Mahalkurrees or Thanadars. (Regulation XII. of 1827, Act XX. of 1835.)
- 2 Landholders. (Regulation XV. of 1827, IX. of 1831, and Act XV. of 1840.)
- 962 Village Officers. (Regulation XII. of 1827, Chap. VI.)

Strength of the Kolar Police Corps.				Strength of the Guzerat Irregular Horse.			
Number.	Names of all Ranks.	Pay of each Rank.		Number.	Names of all Ranks.	Pay of each Rank.	
		Rs.	a. p.			Rs.	a. p.
1	Commandant.....	6,283	8 0	1	Commandant.....	10,539	0 0
1	Adjutant.....	4,399	8 0	1	2nd in Command..	4,539	0 0
1	Subedar Major.....	804	0 0	1	Adjutant.....	2,050	8 0
1	Subedar.....	504	0 0	1	Assistant Surgeon..	5,632	8 0
7	Subedars.....	2,520	0 0	4	Russaldars.....	7,200	0 0
1	Jemadar.....	294	0 0	4	Russaidars.....	3,840	0 0
7	Jemadars.....	1,260	0 0	8	Naib Russaldars....	4,800	0 0
1	Havildar Major.....	288	0 0	8	Jemadars.....	4,320	0 0
7	Havildars.....	1,176	0 0	8	Kode Duffedars....	3,360	0 0
30	Havildars.....	2,880	0 0	64	Duffedars.....	21,504	0 0
30	Naiques.....	2,160	0 0	8	Nishanburdars....	2,688	0 0
516	Privates.....	30,960	0 0	8	Trumpeters.....	2,400	0 0
2	Buglers.....	240	0 0	180	Sowars.....	2,01,000	0 0
8	Bheesties.....	576	0 0	<i>Extra Establishment.</i>			
8	Allowance for Orderly.	180	0 0	1	Wurdee Major.....	1,260	0 0
8	Company's allowance..	768	0 0	1	Persian Writer.....	360	0 0
1	Armourer.....	144	0 0	1	Nukeeb.....	300	0 0
1	Assistant ditto.....	96	0 0	1	1st Hospital Assistant	300	0 0
1	Bellows Boy.....	48	0 0	1	2nd ditto ditto..	240	0 0
1	Mechee.....	96	0 0	1	Chowdree.....	180	0 0
1	English Writer.....	240	0 0	1	Mussudee.....	96	0 0
2	Karkoons.....	480	0 0	1	Trumpet Major....	60	0 0
	Allowance for Steel and Charcoal.....	120	0 0	2	Lascars.....	144	0 0
1	2nd Hospital Assistant.	240	0 0	3	Flagmen.....	216	0 0
	<i>Bhoom Sowared.</i>			8	Bheesties.....	576	0 0
1	Jemadar.....	360	0 0		Stationary allowance.	360	0 0
19	Horsemen.....	4,104	0 0		Matchlock allow- ance.....	360	0 0
					Mess allowance....	720	0 0
					2nd Horse allowance to Adjutant.....	360	0 0
					Education.....	24	0 0
		Rs..	61,521 0 0			Rs..	2,82,429 0 0

Of the above, one-half are employed in the Kaira Collectorate.

Of the above, 145 are employed in guarding the roads and stations in the Collectorate. A detachment is placed at Hur-ole, for the protection of the Mahce Kaunta, and the rest available as they may be required. At present a detachment is at Deosa, to replace the cavalry gone on field service.

MANUFACTURES.

The following information was obtained from Goolam Russool, merchant:—
Silk manufacture is still carried on to some extent in Ahmedabad, but the extent of it is much fallen off of late years.

The silk is principally imported from Bombay to the houses of Jeevon Nagjee, and Sakurchund Premchund, who supply the inferior traders.

The following are the kinds of silk brought into Ahmedabad, and usual prices :—

Distinguishing Colours.	Names by which they are known.	Imported from.	Price per Seer.
Pela, yellow.	Gunnanee.	Bussorah.	Rs. 11
Leela, or green.	Cheenee.	China.	13
Sufed, or white.	Sooturfeen.	China.	12
Bunuck.	Bungalee Neekorda.	Bengal.	9

From the merchant the silk comes into the hands of the Tageeas, who open the silk, and then sell it to the Musroowala, or master silk-weaver, at an advance of Rs. 1 or $1\frac{1}{2}$ per seer. The Musroowala sends the silk to the spinners, who are called Rentiawalas, who charge from Rs. 10 to 40 for spinning 20 Indian seers, according to the fineness of the thread produced: they are able to spin half an Indian seer daily. The spinning wheel used by the silk manufacturer is large, being about 6 feet in diameter, which turns a number of small reels, the threads on which converge, till they are united and wound upon a drum.

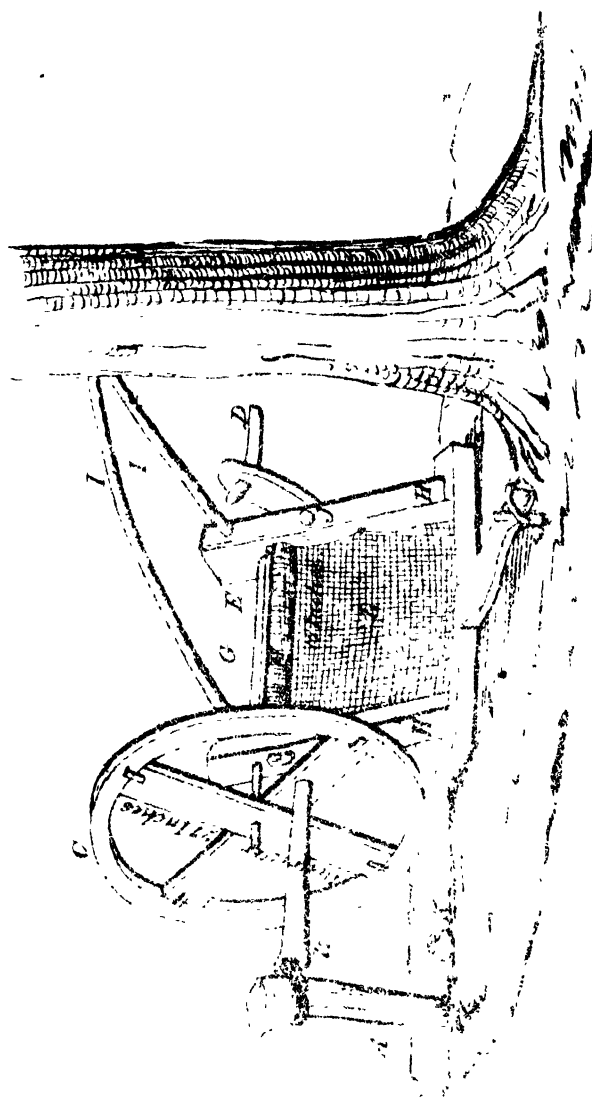
The following apparatus is used in the manufacture of cotton goods:—

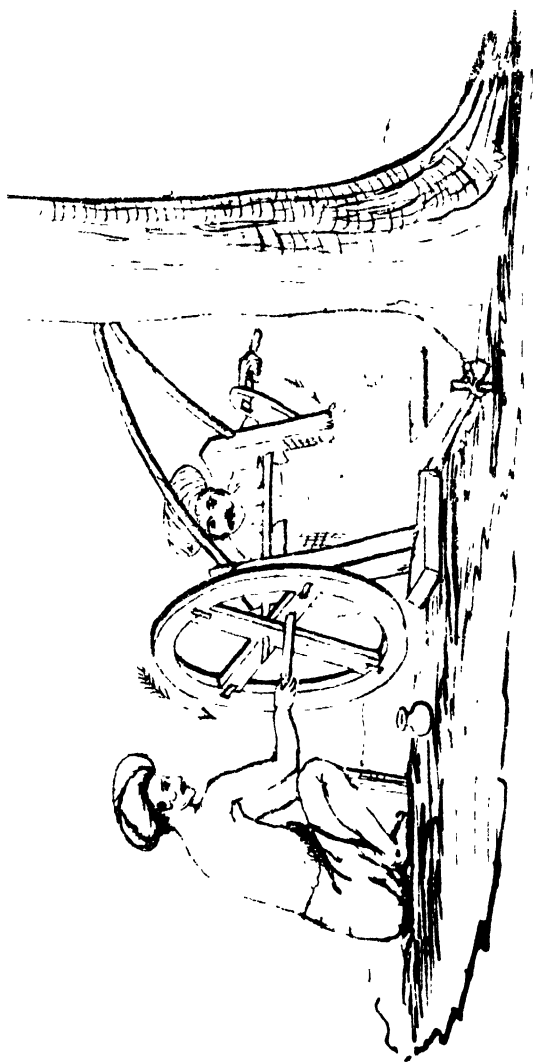
These sketches represent the churka used for cleaning cotton. It is worked by two men, who turn two cylinders of different sizes, the large one of wood, and the less of iron, contrary ways. One man feeds the machine with cotton, which is taken in between the cylinders, and the seed is squeezed separate, and falls behind to the ground. Two men are able to clean from one and a half to two maunds per diem. They are paid at the rate of 2 annas each for 20 seers Bengal weight of uncleaned cotton.

Description of the Churka by reference to the Sketch.

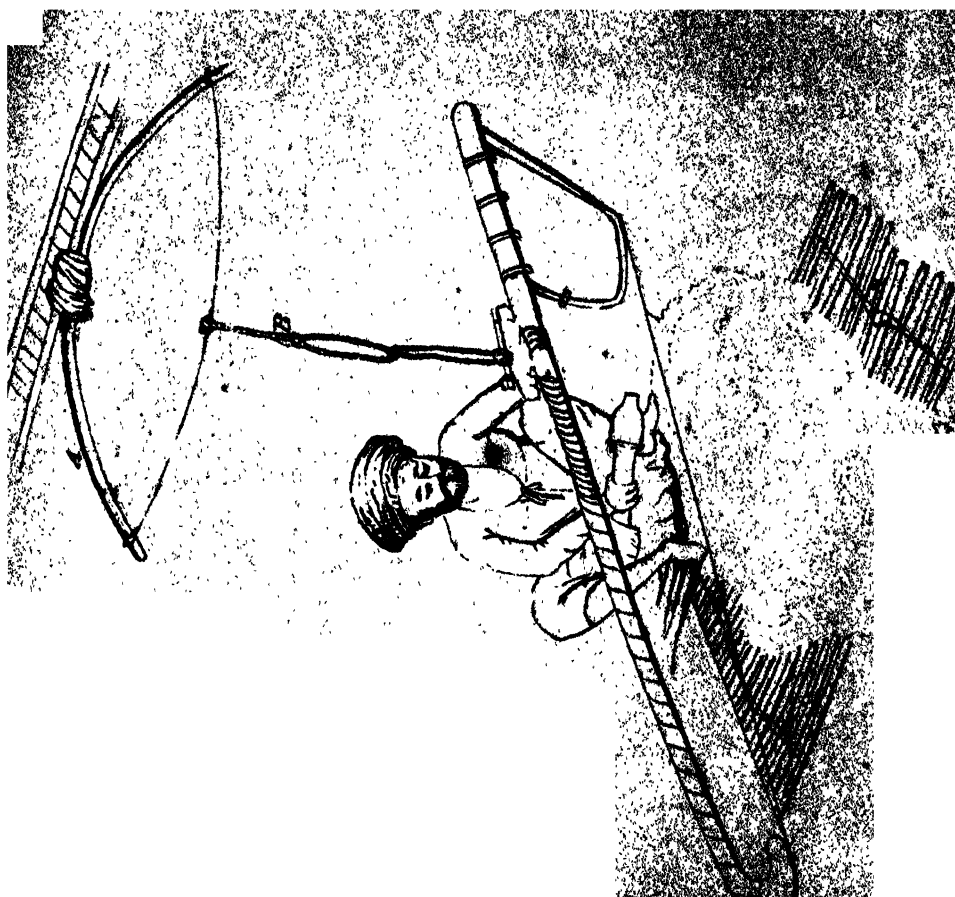
- A Ghora.—A large peg to support the soeco or handle B, by which the wheel is turned, the other end going into a hole in one of the spokes.
- B Soeco.—The handle, made of babool wood.
- C Chuckur.—The periphery of this large wheel is generally made of split bamboo, tied together, and charged with cow-dung, to give weight, by which the iron axle or roller is turned.
- D Pangotees.—A handle which turns the cylinder F, fixed under the axle of the large wheel, and fits quite close to it.
- E The Kuna is the name of the iron axle, which is about half an inch in diameter.
- F Lathica.—The cylinder, usually made of babool wood, $1\frac{1}{2}$ inches in diameter. The pangotees D is fixed to it, and by a crank called dhootas.

The Traverses

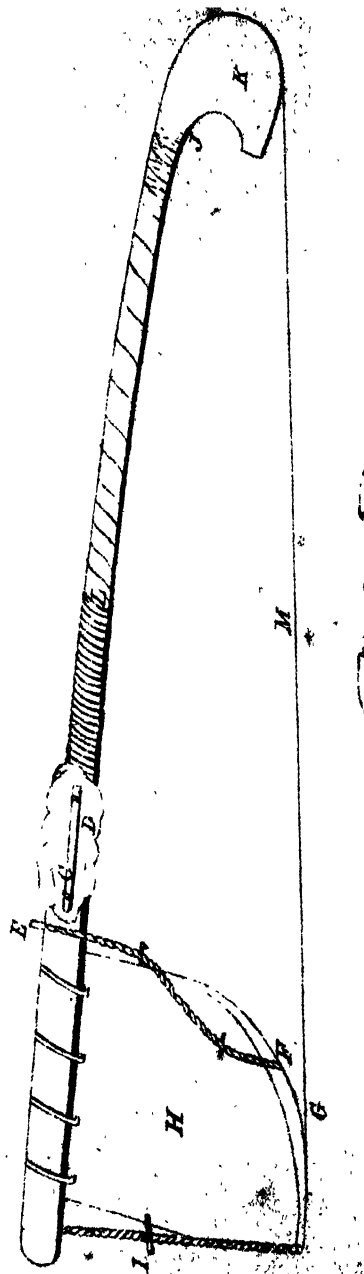




Water wheel in 1857



The Pinjun.



The "Optelic" or Mallet.

- G Kamptee.—A piece of bamboo placed over the kuna E, to prevent the cotton from wrapping round the axle on its separation from the seed. The iron axle is rubbed with a piece of sandstone, to give it a rough surface, by which means it takes hold of the staple of the cotton, and the bamboo above it serves to scrape it off as it revolves.
- H Thambala.—The uprights upon the frame called the beswee, to which is attached a pooncheea or tail, which is tied down at the end to a peg driven in the ground.
- I I Taoo.—Two pieces of wood fixed tight against a tree or a wall, to keep the machine tight and firm during its use.
- J Two wedges to tighten the latheea F against the iron axle (kuna, E).
- K Cöölee.—A pot to hold oil, a quarter of a seer of which is required for one day to lubricate the axle and the wooden cylinder.
- L The Gagree, or apron, to keep the cotton apart from the seed, the cotton falling on the one side and the seed on the other. Two men are able to clean one Indian maund per diem during the hot months: during the cold weather about 20 or 25 seers Indian weight is all they are able to separate from seed. The labourer receives 2 annas per 20 seers (Indian weight). If they separate more, they get more wages. In one maund, 10 seers of cotton and 30 seers of seeds are separated.

The price of cotton with seed is, at Surkey (in January 1849), Rs. 1-14-0 per Indian maund; cleaned cotton is Rs. 7 per Indian maund; kupaseea or seed is 35 seers India weight per rupee.

The price of a churka complete is Rs. 2½.

After the cotton has been passed through the churka, it goes to the Pinjara or cotton cleaner, whose apparatus (pinjun) is delineated opposite. It is difficult to describe the operation. The workman by a blow of a piece of wood, shaped like a dumb-bell, twitches the string of the instrument in the cotton, which throws it up in the air, and separates the dirt. They work the cotton backward and forward till it is considered sufficiently clean. The matting of reeds on which the cotton is placed allows the dirt to fall through, and it is thus kept separate.

Description of the Pinjun by reference to the Sketch.

- A Kamtee.—The bow, to give a spring, is fastened to the roof overhead.
- B Junjnee.—The string to adjust the height of the pinjun.
- C Ghoree.—A bamboo, to which B is tied.
- D Hutvasee.—A padding of cloth and cotton, between which and the pole the left hand is introduced, to hold the pole.
- E Agotur.—Of catgut, for stretching a piece of leather F over the butt end of the implement.
- F Kakur.—The goat leather (untanned) on which the catgut is stretched.
- G Geegree.—The bridge, made of old leather, and introduced between the wood of the phulla, marked H, and the kakur, which gives the peculiar twang which accompanies the use of the implement, and without which the workman cannot get on.
- H Phulla.—A quadrant made of teakwood, half an inch thick in the middle, and above an inch thick at the periphery.
- I Pachotur.—Made of catgut, and serves to hold the end of horizontal cutgut.
- J Wadhuree.—Leather straps of tanned leather, to save the cutgut from friction.
- K Sukurwancee.—The bill at the end of the machine for the catgut to come round.
- L Dandee.—The pole which serves to keep the catgut stretched, and around which the spare end of the catgut is twisted, to be brought forward as that in use wears out.

- M Taunt, or catgut, obtainable at Ahmedabad at the rate of 35 cubits per rupee, and lasts about a month.
- N A matting, made of the lower part of the surkut or giant grass, and serves to keep separate the leaves and dirt as detached.
- O Gotecla or malet, made of tamarind wood.

The cost of a pinjun with catgut and malet complete is Rs. 5.

● *Description of the Loom by reference to the Sketch.*

- A Suckaroo.—Yarn roll, on which the thread from the warp is wound.
- B Tore —Cloth beam or breast roll, on which woven cloth is wound when finished.
- C Tana Band, Wance Russee.—A rope which produces the required tension of the thread of the warp. It is tied to a peg at C.
- DD Powree.—Treadles, on which the weaver presses his feet alternately. The treadles are in the hole where the weaver sits.
- EE Dinglee —Two pieces of stick to which are united the heddles or harness.
- FFFF Jotra.—Four stings attached to the heddles, and fixed to E E.
- GG Rach.—Heddles or harness. These are furnished with a loop at the points where they are intersected by the warp, each individual thread of which is passed in regular succession through the cords of one or other of the heddles.
- II Barah —Sheds. The space of the passage of the shuttle.
- Kantla —Shuttle. Made of either blackwood or tamarind wood.
- Kokra.—Quills. The hollow cane on which the threads for shooting into the woof is wound.
- I Hatha.—Batten lay. This is suspended to the roof by strings tied to slips of bamboo (J J) called dauncys, and swings to and fro, and is jerked towards the cloth roll after the shuttle is shot through the shed.
- K Janjeero.—The shuttle race. The bar under the batten, between which the reeds are fixed.
- L Seccareea —The horizontal stick lay cap, placed between the alternate threads of the warp to prevent their becoming entangled.
- M Khurick The horizontal stick on which the threads of the warp rest.
- N Doree.—Two horizontal sticks of reeds, the same as for L.
- O Dusta.—Weaver's seat.
- P Mutec.—Two sticks placed horizontally, to keep the cloth stretched to its proper width. Four or five prongs are attached at their ends.
- Q Funny.—The reed.
- R Killah —Pegs or posts.

PAPER MANUFACTURE.

The following information was given by Bhadoo Bhaee, a master paper manufacturer :—

●

The manufacture of paper gives employment to about 800 people. The only machinery used is a pounder of rude construction. The paper is principally made of old gunny bags and taut (very coarse descriptions of sackcloth), which is mostly brought from Marwar on camels or pack bullocks, and is sold at from Rs. $1\frac{1}{2}$ to $2\frac{1}{4}$ per Indian maund. This is all cut up into pieces an inch or half an inch long, and then taken to the river, and put in a large sheet, tied between the waists of two men; in which way the material undergoes a washing. When all the impurities of dust and sand are removed, the stuff is brought to the manufactory, and steeped in troughs mixed up with chunam

or fine line, in the proportion of 10 lbs. to one Indian maund, in which it remains eight days to steep, after which the pulp is taken and pounded. Heavy iron hammers with levers are fixed to a wooden beam, and worked by four men. After the pounding, the pulp is taken again to the river and washed, and brought to the cistern, when it undergoes another process of decomposition, by being mixed with the chunam and sajee khar alkali, and steeped for from ten to fifteen days, being intermediately pounded every second or third day, and returned to the cistern. After this process the pulp undergoes a third washing, and is then set to dry on a terrace. Soap is now used for washing the pulp, and alternate washing and drying goes on for a week. The quantity of soap used is 8 lbs. to 2 Indian maunds of material. The value of the paper depends on the washing which the pulp undergoes. At the first stage, coarse inferior paper is made, and the finest paper, called sahebkhane, requires eleven or twelve washings. This process is continued many times, according to the fineness of the paper required. After the process of washing, the pulp is taken in balls to the paper manufactory, and put into troughs, and made into sheets in the usual way. The frame in which it is shaped is made of veerun, a sort of grass growing in the district towards Baroda, and sold here at the rate of four or five bundles per rupee. These are joined and tied together with horse-hair. The makers of these frames reside near the Sultan Ahmed Roza, and charge 8 annas per frame for the small size paper, and for the largest size paper, called sahebkhane, the frame costs Rs. 2.

The art of making the paper is confined to the Kagdee Company, who consist of Syuds, Putans, Sheikhs, and Mirzas, and monopolize the making.

After the paper leaves the manufactory, it is taken to the Arwala, or sizeman, who charges Rs. 1½ for sizing 100 quires of the beereegura kind, and so on increasing by one rupee to Rs. 6 for the sahebkhane.

The next process the paper undergoes is the mohorra (polishing), for Rs. 1½ to Rs. 12 for 100 quires.

The following are the names of the several kinds of paper manufactured at Ahmedabad, with their dimensions and prices :—

Names.	Length in Inches.	Breadth in Inches.	Prices of 100 Quires.	
			Lowest.	Highest.
			<i>Rs.</i>	<i>Rs.</i>
Beereegura	16	16	10	28
Mehmoodshahie	19½	18½	17	40
Moradshahie	22	21	32	65
Cambatee	24	22½	40	95
Sahebkhane	27	25½	70	130

Paper manufactured at Ahmedabad is exported to the north as far as Pahlunpoor; to the west as far as Bhooj and Mandvee, and the whole of Kattiawar; and south to Bombay, where the account books of all Native merchants are

made of it. Large quantities are exported to Baroda, and a small quantity finds its way into Malwa to Indore, Oojein, and Rutlam. The Borahs are the venders of paper, and have as many as ten or fifteen warehouses in the Kaloo-poor district of the city, where the paper is tied up, and packed and sorted in gaha and thokree, which assimilate to reams and quires:—

24 Sheets (Taow) = 1 Gaha.	
25 Gaha = 1 Thokree.	

The ordinary rates of hire to the labourers employed are as follows:—

Able-bodied men.....	4	annas per diem.
Ordinary	3	" "
Boys, 12 years.....	2	" "
Ditto, 10 ditto	1½	" "
Ditto, 8 ditto	1	anna "
Ditto, 6 or 7 ditto.....	0½	" "

These last mentioned merely attend on the workmen, to bring them water, food, &c.

Men employed in making the paper receive for:—

Beereegura	Rs. 1	10	0	per 100 quires.
Mehmoodshahie.....	2	2	0	" "
Moradshahie	2	8	0	" "
Cambatee	3	0	0	" "
Sahebkhane	5	0	0	" "

The manufactory is closed on Fridays, and the 11th day of the moon, which is a holy day of the Peeran Peer, and other Mahomedan festivals. When marriages happen amongst the company of the Kagdees, and when deaths take place among them, the pounding work is stopped, but all other work proceeds.

There is a cessation of paper-mill work from Asarsood 10th (July) to Asosood 10th (the Dussera day), a period of three months.

CAPITAL EMPLOYED.

The capitalists of Ahmedabad speculate largely in Malwa opium, and it is asserted by them that upwards of fifty lakhs of rupees are employed in this trade in Ahmedabad alone. The system of waeeda or anticipation bargains still prevails, notwithstanding the Act lately passed. Speculation on the rise or fall of the opium sales in Calcutta is still carried on as a system, and even the young people of the Sowkars' families bet on the average of the sales at Calcutta, beginning by betting in buddams, the smallest amount in use, reckoning 12 to one pie. *

The amount of capital afloat in the export trade of cotton is said to be about five or six lakhs of rupees.

In silk 2,955½ Indian maunds were imported into the city of Ahmedabad in 1847, valued at Rs 9,67,926½.

IMPORTS AND EXPORTS, FROM OFFICIAL SOURCES.

The following statements regarding Imports and Exports are made upon information obtained from the Customs Department at Gogo :—

Statement of the Shipment of Boxes of Malwa Opium, under Government Passes, from the Port of Gogo, during the following Years :—

Years.	Imports.			Exports.		
	Number of Boxes.	Weight.	Declared Value.	Number of Boxes.	Weight.	Declared Value.
		Seers.	Rs.		Seers.	Rs.
1833-34	317	....	3,17,000
1834-35	60	....	65,000
1835-36	925	....	9,25,000
1836-37	1,797	....	17,97,000
1837-38	725	....	7,25,000
1838-39	1,361	....	13,61,000
1839-40	112	....	1,12,000
1840-41	625	....	6,25,000
1841-42	873	121,839	8,73,000
1842-43	144	205,920	14,40,000
1843-44	1,298	185,614	12,98,000
1844-45	1,800	257,400	18,00,000
1845-46	2,992½	427,927½	29,92,500
1846-47	1,505	215,215	15,05,000

[NOTE.—The value of each box is taken at one uniform rate of Rs. 1,000. Opium imported on account of Government is not registered in the Custom House at Gogo.]

Cashmere Shawls annually Shipped at the Port of Gogo, from the Mart of Pallee, in Marwar.

Years.	Number of Bales Shipped to Bombay.	Estimated Value.
		Rs.
1839-40	34	1,45,972
1840-41	248	10,80,592
1841-42	109	5,14,203
1842-43	198	10,53,250
1843-44	240	14,82,671
1844-45	238	5,22,908
1845-46	167	9,70,969
1846-47	236	10,24,995

Abstract Statement showing the Official Value of all other Goods actually imported and exported at the Bunder of Gogo, during the following Years:—

[Opium is excluded from this Statement, being shown in a separate Statement.]

Years.	Imports.	Exports.	Total.
	<i>Rs.</i>	<i>Rs.</i>	<i>Rs.</i>
1830 .....	....	....	....
1831 .....	....	....	....
1832	1,96,068	2,16,076	4,12,144
1833	9,31,998	4,98,421	14,33,419
1834	13,22,094	3,36,072	16,58,166
1835	5,33,616	4,17,247	9,50,893
1836	22,69,864	6,90,024	29,59,888
1837	15,62,357	7,80,928	23,43,285
1838	15,76,378	11,42,343	26,82,018
1839	17,23,188	4,45,579	21,55,823
1840	21,83,870	8,20,016	33,03,886
1841	28,47,621	15,12,126	43,59,747
1842	35,98,633	10,79,866	46,18,199
1843	41,80,731	8,66,104	50,46,835
1844	37,19,651	13,97,333	51,16,981
1845	32,02,944	10,59,266	42,62,210
1846	30,21,391	5,57,299	35,81,690
1847	31,32,223	9,11,770	40,43,993

Extract from a Statement of the Export of Cotton to Bombay, from the three Ports situated in the Ahmedabad Collectorate, from the Years 1834-35 to 1846-47, as per information obtained from the Assistant Collector of Customs at Gogo.

Years.	Dholera.		Gogo.		Bhownuggur.	
	Bengal Mds. Seers.		Bengal Mds. Seers.		Bengal Mds. Seers.	
1834-35	31,588	23½	11,864	27¾	32,772	10
1835-36	207,112	19½	37,432	14¾	111,126	10
1836-37	193,319	5¼	45,417	19	46,910	0
1837-38	217,718	39	66,149	20¾	131,327	20
1838-39	68,626	39½	2,458	8½	5,002	20
1839-40	1,190,147	30½	46,901	0¾	55,038	37½
1840-41	330,371	7	73,040	31½	39,948	39½
1841-42	193,106	15	63,599	24½	85,712	22½
1842-43	286,546	3	82,286	37½	104,231	25
1843-44	334,813	31	86,262	33¾	124,282	27
1844-45	271,075	20	62,661	39	116,217	10
1845-46	159,852	33	10,403	12½	28,248	24
1846-47	345,032	13	51,005	19¾	143,981	35½

EXCHANGE.

The rates of bills of exchange, or hoondies, as they are generally called, are of course governed by the actual state of the money market as to plenty of coin or otherwise. The state of the trade in Rutlam and Palee, in the former as regards opium, in the latter as regards shawls and wool, has a great effect on the trade in Ahmedabad.

The state of exchange between Company's Rupees and Ahmedabad Siccas is remarkable: the former, being intrinsically more valuable, are now at a discount.

Statement of the Rates of Exchange between Company's Rupees and Ahmedabad Siccas, in the Ahmedabad Market, from the first introduction of the Company's Rupees in June 1837.

Years.	Exchange of Sicca Rupees per 100 in favour of Company's Rupees.				Exchange of Sicca Rupees per 100 against the Company's Rupees.			
	Highest.		Lowest.		Highest.		Lowest.	
	Months.	Amount.	Months.	Amount.	Months.	Amount.	Months.	Amount.
		Rs. a. p.		Rs. a. p.		Rs. a. p.		Rs. a. p.
1837..	June.....	3 8 0	November..	1 4 0				
1838..	January ..	3 12 0	April	1 4 0				
1839..	December..	6 12 0	July	3 0 0				
1840..	May	7 8 0	December..	3 0 0				
1841..	May	4 12 0	April	2 0 0				
1842..	June	4 2 0	February .	1 12 0				
1843..	April	3 4 0	July	1 6 0				
1844..	June	1 8 0	April	0 2 0	July	99 15 0	October..	99 2 0
1845..	January ..	2 0 0	February ..	0 4 0	November..	99 12 0	August..	99 8 0
1846..	.....	.....	.....	.....	November..	99 8 0	June ..	97 4 0
1847	.....	.....	.....	.....	January ..	98 12 0	May	95 0 0
1848..	.....	.....	.....	.....	April	97 2 0	June .	95 6 0

Within the last ten years the price of silver in the Ahmedabad market has fallen from 2 annas 1 pie to 2 annas per tola (equal to 180 of English weight in troy grains).

WEIGHTS AND MEASURES.

The weights and measures at present in use in the Ahmedabad zillah were introduced on the 15th July 1847.

The Ahmedabad Sicca Rupee, which was the unit of all the weights, weighed 192 grains troy, and the seer most generally in use was equal to $41\frac{1}{2}$ Ahmedabad Siccas in weight; but there was a great diversity of weights, without any fixed standard for testing them. It was therefore considered advisable to introduce the present weights, by making the Company's Rupee of 180 grains troy the unit of a tola, and 80 such tolas, or 80 Company's Rupees, equal to one seer, according to the Bengal measure; but for the sake of convenience, the people called the 80 Rupees' seer a pukka seer, and the 40 Rupees' seer a kucha seer, which latter approximates to the old seer.

The following are the tables of weights and measures adopted for general use in this zillah, the old local names and division being still retained :—

Gold and Silver.

Ruttee.		Wal.		Guddeena.	
3	=	1			
48	=	16	=	1	Tola.
96	=	32	=	2	= 1

Dry Measure.

1 Company's Rupee	.....	= 1 Tola.
5 Company's Rupees	.....	= 1 Udhole.
10 Ditto ditto	.....	= 1 Nowtang.
20 Ditto ditto	.....	= 1 Paoseer.
40 Ditto ditto	.....	= 1 Adseer.
80 Ditto ditto	.....	= 1 Seer.
40 Seers	.....	= 1 Maund.
20 Maunds	.....	= 1 Candy.

Liquid Measure.

A measure containing 10 tolas weight of pure water equal 1 pullee, 8 pullees one seer, or 80 tolas of pure water.

Measures of capacity for grain, &c. have been hitherto only partially used, for which the seer measure above-mentioned is adopted, and the terms in use are declared to be the following :—

1 Adwallee....	= 1 seer, or 80 tolas of pure water.
2 Ditto	= 1 Pullee.
2 Pullee	= 1 Manah.
10 Manah.	= 1 Maund.

The only measure of length was the guz, which varied from 21 to 27 inches. That, however, of 24 inches being very general, the same was adopted, and this agrees with the English measure of 2 feet.

The weights are made of iron, and of a square shape, to secure uniformity and equality. Each weight, upon application of the owners, is stamped with the Government mark under the superintendence of the City Foujdar or Mamlutdar, and a fee of one anna per weight is charged to cover expenses.

The assay is made by touch needles, made up as shown in Fig. 1, the ends tipped with gold.

Gold purchased on the touch of mark 13½ is priced at the undermentioned rates, according to a statement given by the goldsmiths of Ahmedabad before the Magistrate :—

Marks.		Rs.	a.	p.	
Touch of 13½	.....	19	4	0	per tola.
„ 13½	.....	18	14	3	„
„ 13	.....	18	4	0	„

FIG. 1.

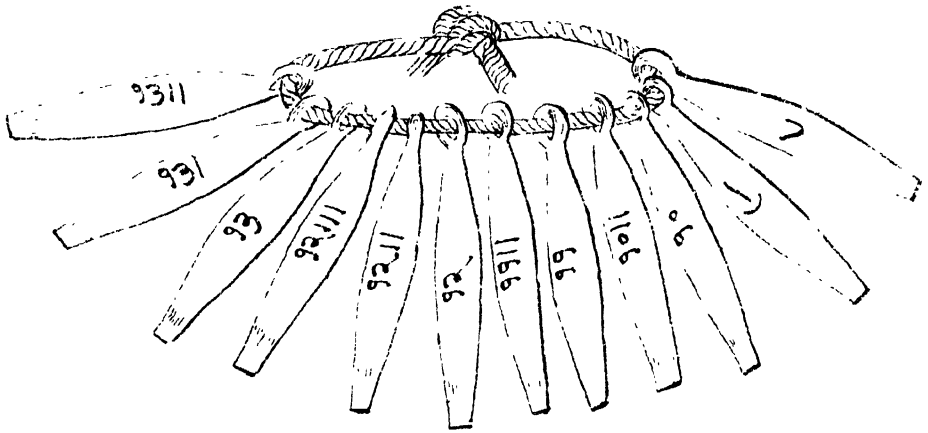


FIG. 2.

OBVERSE.

REVERSE.



ACTUAL SIZE OF THE COIN

	Marks.		Rs.	a.	p.	
Touch of	12 $\frac{3}{4}$	.....	17	14	0	per tola.
"	12 $\frac{1}{2}$	.....	17	8	0	"
"	12	.....	17	1	0	"
"	11 $\frac{1}{2}$	.....	16	5	6	"
"	11	.....	15	0	9	"
"	10 $\frac{1}{2}$	.....	14	15	0	"
"	10	.....	14	3	6	"
"	9	.....	12	12	9	"
"	8	.....	11	6	0	"

The price of silver is as follows :—

	Marks.		Rs.	a.	p.	
Touch of	18	.....	1	2	0	per tola.
"	17	.....	1	1	0	"
"	16 $\frac{1}{2}$	.....	1	0	6	"
"	16	.....	1	0	0	"
"	15	.....	0	15	0	"
"	14	.....	0	14	0	"
"	13	.....	0	13	0	"
"	12	.....	0	12	0	"
"	11	.....	0	11	0	"
"	10	.....	0	10	0	"
"	9	.....	0	9	0	"
"	8	.....	0	8	0	"
"	7	.....	0	7	0	"
"	6	.....	0	6	0	"

COINS.

The Ahmedabad Sicca coin is still most current amongst traders. The supposed circulation is Rs. 1,50,00,000. Sicca is gradually decreasing, by being sent to the Bombay mint as paid to the treasury, but the state of exchange has risen so much above the intrinsic value of the Company's Rupee, that it is now seldom paid into the Government treasuries. The old copper coinage is entirely superseded.

The device of the Ahmedabad Sicca is as shown in Fig. 2.

The inscriptions, of course, vary according to the different reigns in which the coins were made: sometimes they have been made thicker than the specimen shown. The workmanship is coarse, and the rupees mostly chipped at the edges, and somewhat defaced.

BANKING OPERATIONS: LENDING AND BORROWING.

The following information is derived from Seth Hemabhaee Wukutchund Nuggurseth, and Moteebhy Govindram, Dufturdar :—

Money is advanced upon security of goods, jewels, houses, and lands, at the following rates of interest, according to their relative value and risk :—

On gold ornaments.....	3	per cent.
On silver ditto	3	„
Precious stones and pearls	6	„
Houses, according to locality.....	6 to 9	„
Land held on rent-free tenure.....	12	„
Ditto paying rent to the Government	12 to 18	„

The above goods are valued by appraisers. Money is advanced to rajahs and other petty chieftains at an interest of from 9 to 12 per cent. on the security of their territorial possessions. It was formerly the custom to take Bhats (the bards of the country) as security, but since the British accession the Bhats' security has become obsolete.

The usual rate of interest on money deposited with Native bankers is 3 per cent.

The principal place where banking business is carried on in this city is called Manick Choke. It is situated in the very heart of this city. Business in time bargains commences at 8 P. M., and ends at midnight. The principal transactions are mostly in opium, which go by the name of suttahs, or bhoje or waeeda. Actual sales are also agreed upon, as the case may be. Dullals (or brokers) negotiate the bargain. Transactions in ready money or hoondée payments are conducted between the hours of 9 and 12 in the forenoon. If bills be presented for payment subsequent to 12 at noon, the date is counted from the day next following.

Business in foreign bills (hoondies) continues from 9 o'clock till sunset : if a bill be presented after sunset, it is accepted, but the date of the day next following is endorsed.

In the time of the Native Government the bankers confined their trade to agency for the standing army of the State, in paying the soldiers on the security of their commanders, charging a small discount, and ultimately receiving orders on the State treasurers for the advance made, on presenting the receipts of the commander in chief. The bankers also had established agencies at Delhi and Poona, the then capitals of the Governments of the country. The bankers who carried on business as army agents were called Potedars.

In the year A. D. 1819 the business of trading in opium commenced at Ahmedabad. The first person who engaged largely in this trade was Kurrumsee Doongursee, a Native of Pahlunpoor. Subsequently an immense capital was embarked in this business. The necessary expenses and profits of a banking establishment at Ahmedabad are provided for by commission, payable by the constituents upon opening accounts, and paying and receiving money. The commission when the security is good is usually $\frac{1}{4}$ per cent.

MODES OF TRANSIT AND COMMUNICATION.

By Land.

The general means of transit are carts drawn by bullocks, also camels and pack bullocks. The carts are large and commodious, and drawn frequently by four bullocks, and in heavy roads more are added on by loose yokes, called tureela. Camels are chiefly used by persons coming from Pallee and other places to the northward, but they are not brought in large numbers. The pack bullock is nearly confined to the Brinjaries, and used in transporting salt to the interior.

Little has been done in road making, except in Ahmedabad and its immediate vicinity. The longest of these extends from the city to the camp, about four miles. A bridge has been built over the Kharee river at Lallee, on the road to Kaira, and one between Omlee and Dholera, over a creek. Two others, which are very much required, are in contemplation, one over the Bhogawa at Bholad, and the other over a creek near Goondala. There is also a piece of road of about two miles made from the town of Gogo towards the interior, over a marshy plain. Roads are also in progress in the town of Gogo, and a small velard about 350 yards long has been built from the town of Veerumgaum across the tank, thereby admitting of communication with the main road to Ahmedabad at all seasons. The roads through the country are merely the tracks formed by the carts, &c. passing. In the black soil they fall into deep ruts, and in the white goraroo soil they are frequently very heavy; but in some kinds of goraroo, where there is some slight mixture of firmer soil, the roads remain in comparatively tolerable condition.

By Water.

There is no internal means of transit by water, unless the creeks up to the bunders near Dholera and Bhownuggur may be so called; but as there is no village situated in the course between the bunder and the open sea, and the whole of that part of the country being liable to flood, it seems unentitled to be considered as inland navigation.

IMPEDIMENTS, AND THEIR DURATION.

The principal impediment to inland travelling is the monsoon, during which, if the rain is heavy, some parts of the country become quite impracticable. It may be mentioned generally that where the black soil prevails, the impediment is greatest; and where it becomes sandy, the less so, as this soil becomes compact under the action of rain. Traffic is usually suspended from the middle of June till October, varying some days at either end, according to the weather.

Besides the monsoon there are impediments from rivers. The Saburmuttee is impassable in flood, except by ferry; and during the dry weather, the very deep sand in the bed, which is generally about a quarter of a mile across, of which perhaps only 20 yards are covered with water, is very trying to the cattle.

The crossing at Bholad is at present very bad, and even dangerous. It is very broad at high water, perhaps (counting both branches which occur at that place) about half a mile. The tide rushes in sometimes so violently that carts are overtaken in passing, and unable to get out, in which predicament I found two the last time I was there. Several creeks occur between Bholad and Bhow-nuggur, but Goondala is the only other place that is very bad. By going a little to the westward, a tolerably safe ford is found in the Bhow-nuggur creek, called Mhadya na Ara.

FORDS, FERRIES, AND BRIDGES.

There is very little depth of water in the Saburmuttee, so that it is fordable almost everywhere above the influence of the tide, which reaches about as far as Mutamun in the Dholka purgunna. The Meswa, Majum, Watruck, and Kharee are also easily fordable; the other rivers are small, but some of them are difficult to cross when they become creeks. When they arrive at this stage, (which happens all down the shores of the Gulf of Cambay as far as a few miles south of Gogo,) they are frequently full of deep mud, and being also affected by the tides, cause delay in passing. The principal of these places have been mentioned above; I am unable to give the names of all smaller ones.

The established rates of fees collected at all the ferries is as follows :—

	If the water in the river is below 6 feet,			If above 6 feet,		
	Rs.	a.	p.	Rs.	a.	p.
For every light garree with bullocks	0	2	9	0	5	6
Ditto man	0	0	3	0	0	6
Ditto baggage cart, with a pair of bullocks	0	3	9	0	8	0
Ditto horse	0	1	9	0	3	9
Ditto camel	0	5	6	0	12	0
Ditto buffaloe, with a calf	0	2	9	0	3	9
Ditto ass, with a load	0	0	6	0	1	0
Ditto man, with a load	0	0	6	0	0	9
Ditto palanquin, with bearers	0	2	9	0	5	6
Ditto goat and sheep	0	0	3	0	0	3

The receipts of course depend on the time that the river is in flood. In 1846 the boats plied for days, while this last season (1848) the boats were not once afloat.

The following is a descriptive list of the ferries in the Ahmedabad Collectorate :—

POSTAL ARRANGEMENTS.

A district dawk was established in 1840, one branch going from Ahmedabad through Dholka, Dholera, and Bhownuggur to Gogo, with a smaller branch from Dholera to Dhundooka, and to Veerungaum; also small lines from Hursole to Puranteje, Morassa, and Byes. The general post at that time consisted of the main north line through Ahmedabad towards Deesa, and a branch to Hursole.

The Rajcote line passed through Dholka, *en route* from Kaira to Rajcote. Since June 1848 the district dawk line from Ahmedabad to Gogo has been put under the general post; the rest remain as before under the Collector.

The district dawk rates of postages are for $\frac{1}{2}$ tola half an anna; for 1 tola one anna; above 2 tolas two annas.

TAXATION.

The numerous items which might formerly have been mentioned under this head have disappeared under the operation of Act XIX. of 1844, leaving few but those which fall on land.

There remains the abkaree or liquor licenses, also for retail sale of opium, the salt revenue, &c.

There are also the town wall funds at Ahmedabad, and the dhurum tulao of Dholera, and Gogo, which are a kind of voluntary contribution for municipal purposes.

Sources of Revenue, and Produce of each Tax.

The principal source of revenue is the land.

The following table gives the net revenue of each description of tax under the control of the Collector, for 1847-48 :—

	Rs.	a.	p.
1. Abkaree	19,436	0	3
2. Intoxicating drugs, poisonous substances, &c. licenses for the sale of.....	747	8	6
3. Opium	2,450	15	3
4. Stamps	73,980	0	0
5. Tolls and ferries	728	0	8
6. Miscellaneous items of sayer revenue	518	14	3
7. Judicial receipts.....	15,649	8	6
8. Post office	3,052	6	5
9. Revenue, extraordinary.....	4,732	3	4
10. Profit and loss	828	1	2
Land revenue of the Ahmedabad Collectorate, on account of the year 1847-48	11,76,352	6	7
Total....Rupees	12,98,476	0	11

Mode of Collection.

In the khalsa villages, and all under direct management, it is the Tehsildar Patel's duty to collect the revenue from the cultivator, according to the instalment fixed, an account of which is kept by the Tulatee (village accountant); and the collections are paid into the Mamlutdar's treasury every eight days, or oftener if the amount reaches Rs. 25. Talookdars make their own arrangements, and are not interfered with as long as they make good the rental of their estates. In most of the khalsa villages there is a Havildar or beadle, to assist the Patel in getting the collections together; in cases where small villages prevail, one Havildar and one Tulatee are appointed to the charge of two or more villages.

In villages where the revenue is taken in kind, the grain is usually left with the cultivator, who sometimes purchases it himself; otherwise, it is collected together, and the Government share separated and sold by auction by the Mamlutdars.

Number of Sebundee or other Corps engaged in collecting Revenue.

Sebundies are not usually employed in collecting revenue. If the Patel requires further assistance, the village Rawunees (guards), or the Mamlutdar's peons, are made use of. It is only in special cases that any Sebundies are sent, and these are of rare occurrence.

HISTORY AND ANTIQUITIES; FACTS ILLUSTRATIVE OF EARLY OR MORE RECENT HISTORY; AND CHARGES, POLITICAL AND AGRICULTURAL.

To do justice to this head would occupy more time than I am able to devote to it. I therefore merely mention the names of a few books which have been written on the subject:—

Mirati Ahmedî; a history of Guzerat, in Persian.

Mirati Sekunder; a similar work, which quotes largely from the former.

History by Pherishta, in Persian. This is the ground-work of Briggs' Mahomedan Power in India.

Ayen Akbary, in Persian; written by Abul Fazel, in the reign of Akbar, which has been rendered into English by F. Glandwin, Esq.

A work on Gujarásthra, by Mr. H. G. Briggs, is about to be published shortly.

PUBLIC BUILDINGS.

Old mosques, tombs, &c. of beautiful workmanship are to be seen in every direction in and about Ahmedabad. They are mostly built of cut stone, in some instances most elaborately carved. Into the particulars of these I am unable at present to enter. The principal are the Jumma Musjid; Shaha Allum Roza, and Musjid; and the Roza of Gunj Buksh, near Sirkeji.

The principal public Government buildings in Ahmedabad are the Adawlut, the Collector's Cutcherry, the Shahibaugh, the Church, the English School-room, the Travellers' Bungalow, the Arsenal in the Guicowar Huwelee, the Seedy Selim Huwelee, and the Jail.

The Adawlut is stated by the Muzmoodars of Duskrohie to have been originally built about 1796, by Krustnarow Bheemrao, commonly called Selookur, for his private residence, and upon the British accession was altered to accommodate the Judge and his Courts.

The Cutcherry is built upon the remains of an old palace of the kings of Guzerat. The front is entirely modernized, and was arranged for its present purpose by Captain Remon, of the Engineers, about 1820. The treasury and some of the offices retain very much of the original character of the place, being but slightly altered from humams or baths, &c. These two buildings are situated in a large enclosure called the Budder, formerly the citadel of the Peishwa's Governor.

The Shahibaugh is usually said to have been built as a pleasure-house by Shah Jehan, and is a very beautiful structure. It is, however, much altered from its original appearance by additions made by the late Mr. Williams, when Political Commissioner for Guzerat in 1831-32. It is at present unoccupied as a residence. It is a very favourite resort of the people of the city, particularly in the month of Shrawun (about August), when they turn out in great numbers to visit it and a temple close by; the roads are sometimes so thronged that near the Delhi gate it is difficult to get through the people on their return about sunset.

The church was built lately by Lieutenant Dickinson, of the Engineers, and consecrated by Dr. Carr, Bishop of Bombay, in January 1848. It is a neat and elegant-looking building, prettily situated amongst some fine trees.

The English school-room has been already mentioned under the head of education.

The travellers' bungalow is a small ugly-looking place, consisting of three small rooms, two of them having still smaller rooms attached to them, with some out-houses.

The arsenal was formerly the citadel of the Guicowar's Government, now arranged as an arsenal, with a dwelling-house and offices for the Commissary of Ordnance of the Northern Division of the Army.

Seedy Selim's Huwelee is a small dismantled fort, now used as a residence by the Assistant Collector of Customs.

The jail is a very fine building, the main entrance of which is highly ornamented. It is said to have been a Mahomedan college originally. It is very extensive, and calculated to hold about 700 prisoners.

There are some fine wells, the remains of former greatness, of which that at Adauluj, and one near the city called Dada Hurry's Bowree, are the finest specimens.

Some tanks have also been elaborately finished, viz. the Kakreya, near the city, that near Sirkej, a very elaborately worked tank called Mohunsur, near Veerungaum, and two at Dholka. These have been built with cut-stone steps all the way round the bank, down to the water. The tank at Veerungaum is situated with small temples all round, and in the centre of the west side is one of large size, built over the sluice, by which water is admitted. All these fine works are, however, more or less in a delapidated state, though still useful as reservoirs of water.

(Signed) E. G. FAWCETT,
Collector of Ahmedabad.

Bombay, 20th February 1849.

A SHORT ACCOUNT OF THE CHOOTA TRIBE.

BY

LIEUTENANT C. J. STEUART,

DEPUTY COLLECTOR, KURRACHEE.

A SHORT ACCOUNT OF THE CHOOTA TRIBE

THE tribe of Chootas claims descent from the Soomrahs, one of the great
Origin of the Tribe. Rajpoot families by whom Scinde was ruled in the middle of
the eleventh century, and whose power was subsequently
overthrown in A. D. 1315 by the Summahs.* The probable period to which
their occupation of the parts of the country at present inhabited by them may
be, and is indeed by themselves† referred, is that at which the Summahs,
assisted by the forces of Allah-el-Din, then Emperor of Delhi, overthrew the
Soomrahs, and established their own sovereignty in Scinde.

But few traces of antiquity are to be found in the country inhabited by
them : the usual number of "Kaffir Kotes" may be seen,
Traces of Anti- but they are so precisely similar to those of Scinde that
quity rare. further notice of them here seems unnecessary. Remains of
very extensive buildings having been at one time carried on are, however,
much more frequent, and to these a more particular reference will be made
hereafter.

The territory inhabited by the tribe is situated on both banks of the Hubb,
that on the right or western bank extending a few miles
Their Territory. further south than on the other, the limits in both cases
being as follows :—

On the north they are bordered by the Brahui tribes of Minguls and Khedra-
nees, the particular boundaries in this direction being a
Boundaries. "luk" or pass between the Zoombra and Barug hills, named
Moosefuree, from that to a pass in the Koodoo hills, named Triphooree, and
thence to a small hill in the plain of the Samote, called Korang. On the east, the

* Vide Burton's History of Sind, chap. i. page 16.

† Evidence of Taroo Khan, one of the principal authorities among the tribe :—

"The Chootas are originally of the Soomrah tribe, while the Noomryas are descended from
the Summahs. Dodeh was ruler or hakim of the Soomrahs. He was killed by Allah-o-deen,
a Mogul prince. At that time the Chootas left Scinde, and joined themselves to the
Brahuis."

The above evidence, borne out as it is by Lieutenant Burton's account, seems to be almost
conclusive on the point.

Keertur, Mehee, and Mol hills separate them from the British possessions in Scinde, and more immediately from the land occupied by the Boorfut Noomryas. On the west, the Pubb hills form a well defined boundary between them and the possessions of the Jam of Beyla, while the Kund stream on the left, and the Vehrab on the right bank of the Hubb may, perhaps, be considered as forming the limits of their territory in a southerly direction. The total extent of land included within these limits may be estimated at about 50 miles in length, with an average breadth of about 25.

Although a small number of the tribe may be found located in the numerous and rocky hills by which their country is traversed, by far the greater portion reside in the "puts" or comparatively level spaces through which the Hubb and its tributaries flow, and these "puts" are more generally referred to in the Tabular Appendix which accompanies this memorandum, and in which is given the distribution, as it exists at present, of the various clans composing the tribe. Changes may, and probably do occur, in the course of every two or three years,* in the distribution now given; but as these periodical shiftings are confined within the limits already specified, the effect produced by them is not very material.

The natural features of the country may be comprehended in a brief allusion, *1st*, to the principal ranges of hills which intersect it, and *2nd*, to the spaces intervening between them. The highest ranges are those of Andharo, and Lakhan, so called from the colour imparted to it by a kind of red stone, resembling in appearance "lakh" or wax. The height of both of these ranges is nearly equal, being 3,800 feet above the level of the sea, though from its rounded summit and swelling form, Andharo does not strike the observer as being so lofty as Lakhan, which rises more abruptly, and with something of a scarped outline. The Bhedoor and Koodoo ranges are distinguished by their broken and steep sides, and by the narrowness of the surface on their summit, whereas the Mol, Mehee, and more especially the Keertur range present a surface in some places of two miles and upwards in width. The Pubb and Keertur ranges are very continuous in their length, and from this circumstance, as well as from their height, and the limited number of luks or passes leading through them, they form an admirable boundary in parts where they are made available as such. Between the Gaj Luk and the southern extremity of Keertur there are not more than four principal passes, those namely of Rohil, Phoosee, Gurho, and Kooteh. Lus Beyla is entered chiefly by a pass through the Pubb hills, leading in the immediate vicinity of the shrine of Shah Belawal.

Besides the above ranges, there are several minor hills, none of which seem to call for further remark. They are all equally barren and destitute of vegetation, unless a species of very coarse and dry-looking grass, termed "kuk,"

* As during the past year, when the plain of the Samote was deserted, in consequence of the entire failure of grass.



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VIRCO



can be called such. This grass, coarse and unpromising as it is in appearance, forms almost the only subsistence for numerous flocks of goats which graze on the slopes of the hills, and in the level spaces at their base.

As has been before noticed, these are usually selected by the Chootas for pitching their rude and wandering habitations. Here they find pools of water left in the beds of the streams, and here also may be had abundance of "pheesh," a species of dwarf palm,* which grows thickly in and about the dry watercourses, and forms a staple article of barter between the Chootas and the inhabitants of Scinde. The lohero tree is also common, but its favourite locality seems to be the plain of the Hubb, where, with kunda and tamarisk bushes, it serves to mark the course of the stream in the naked waste through which it flows.

Cultivation is but rarely attempted by the Chootas. Being, as they are, essentially a tribe of cattle-grazers, they look more to their flocks and herds for the comforts and necessities of life than to the produce of the soil. Throughout the extent of their territory on this side of the Hubb, there are not more than three or four places where the slightest attempt has been made to cultivate. In one of these, a small patch of joaree land is watered by a thermal spring running from the Andharo range.

The general appearance of the men is anything but favourable : they are, if anything, of smaller stature than the Scindee residents of the plains, though the dress worn by them is exactly similar, with this exception, that the pugree or turban is more frequent than the head-dress peculiar to Scinde, and that the "kurkhun" or leather sandal is more generally worn. These are brought chiefly from Lus Beyla, though the poorer classes manufacture them also for themselves, by sewing together layers of untanned goat's skin, or, when procurable, the skin of the ibex. The dress of the females more nearly resembles that worn by Brahui women ; but the respective merits of both sexes, as regards dress and appearance, may perhaps be better understood by a reference to the accompanying sketches than from a more particular verbal description of them.

Their habitations strike the observer as being of most primitive form and construction. Turning round the corner of a hill, or arriving at the top of some small eminence, he will observe in the hollow beneath him, and carefully sheltered from the wind, a collection of eight or ten huts of the rudest kind, occasionally clustered together without any attempt at order, though more generally drawn out in regular line. The next point that will strike him is that at the back of each are piled up carpets, quilts, kumlees or coarse blankets, charpaes, matting, bolsters, camel-saddles,

* The leaves of this palm are turned to a variety of uses, both by Chootas and Brahuis. From it are manufactured the matting and strings of which their huts are constructed ; their shoes, also, or sandals, are made of it. It bears a small acrid berry, which is eaten by the Chootas when pressed by hunger, but does not appear to be turned to any other use.

and an infinite variety of articles, which they seem to have a particular fondness for displaying in this fashion, but which are rarely brought into use, except on occasions of a betrothal or suing in marriage, when the amount of dowry to be expected is calculated by the display that can be made of articles of the nature referred to above.

Another custom, which, however, is not peculiar to this people, is, that in cases of death all the relations and friends of the deceased partake of a feast provided at the expense of the heir, and this is repeated at the subsequent anniversary of the event. Their dead are often carried to considerable distances, in order that they may be buried by the side of their kinsmen, or in the immediate neighbourhood of some great peer or saint, to whom it is usual to offer sacrifices of goats, or to make offerings of the bells which it is customary among them to suspend from the necks of their cattle.

To return, however, to a description of their habitations. These are uniformly constructed of matting or coarse kumlees drawn over a rough framework of sticks, and are either rounded in form like the tilt of a waggon, the ends of the kumlees being in this case drawn together and fastened to the ground by pegs, or are square or rather oblong, as represented in the accompanying sketch.

The females are occupied in preparing food, spinning coarse cloth of camels' or goats' hair, or of the wool of the doomba, and in attending to other matters of domestic economy, which are left entirely to them, while the young men are generally employed in grazing cattle, or in carrying pheeesh* to Scinde, and bringing therefrom the grain and cloth which they purchase in return.

Their wants in this respect are also occasionally supplied by travelling Banyans, who wander from village to village selling cloth, dyed wool, shells for adorning the tassels of their camel-gear, and other articles of traffic, which the Chootas readily receive in exchange for carpets, matting, and kumlees.

The general character borne by the Chootas, even among their neighbours, whose fastidiousness, it may be imagined, is not very great, is of the worst description. Some idea may be formed of it from a rhyming proverb which is common among them; and if pilfering habits and a quarrelsome disposition can be considered as entitling a tribe to the general odium of those around them, the Chootas certainly deserve the epithet thus bestowed upon them.†

* The usual price of pheeesh at Sun, Mahjunda, and other places to which the inhabitants of the more northern parts carry it for sale, is not more than from 12 annas to a rupee per camel load.

† The proverb alluded to is "Choota boota," the signification of which is that every Choota is a rogue; the term "boota" being equivalent to "loocha" or "ludkar."

The settled animosity which has existed from time immemorial between them and their neighbours, and which, but for their mutual dread of the British Government, would display itself more frequently than it does, may be traced to the petty disputes which arise between grazers of opposing tribes. As instances of this, it may be mentioned that the quarrel which occurred lately between the Tooranees and Oothmanees was caused by the latter having allowed some of their cattle, which were diseased, to graze among the flocks of the Tooranees.

Nowsherwan, uncle of the present chief, was shot by a Barcojoh, whose camel he had taken away by force; and every other instance in which quarrels and even bloodshed to a considerable amount have ensued, might probably be traced to the same source.

Their sense of justice is, to say the least of it, original. On discovering the thief, they give him warning, and demand the stolen property. If, after that, he refuse to give it up, they steal in return, and the result generally is, that this goes on till both sides become exasperated. The quarrel is then taken up by the whole tribe or clan, and the probability is that several lives are lost before the feud can be stanchd.

Before the British entered Scinde, their chief animosity was directed against the Jam of Beyla, the Brahuis, Jumalees, and Boorfut Noomryas, and it is easy to see that between the latter and themselves no good will prevails even at the present day, though a nominal reconciliation was effected between the two tribes, when Sir Charles Napier caused Oomed Ali and the late Mulk or Chief of the Noomryas, Ahmed Khan, to embrace in his presence. Disputes between clans are generally settled by the "wuderoh" or headman proceeding to the spot, and making a summary decision in the case.

The present Chief of the Chootas is Oomed Ali. His is a man of middle age, and of rather prepossessing manners and appearance, but is, I believe, tainted with the characteristic faults of his tribe.

His income, which may be reckoned at not more than two or three hundred rupees during the winter months, is derived chiefly from a toll or transit duty levied on kafilahs passing from Khelat and Kandahar through his territories. This toll is collected at a place named Dewance, about $2\frac{1}{2}$ miles distant from his own village, and is fixed nominally at half a rupee per camel, though the usual sum taken is generally a modification of the above amount, and may be reckoned at the rate of twenty or twenty-five rupees for every kafilah consisting of 200 camels. On stray camels, also, belonging to kafilahs, which may be recovered, and not improbably lost through his agency, a species of "pherohce" is levied. Pheesh passing from his territories into Scinde pays toll at the rate of five pice per camel load.

I now proceed to offer a brief description of the principal remains of bund-

Traces of Bundling. ing, of which, as has been mentioned above, numerous traces exist throughout the country; and the first I shall refer to are situated near the Bhallow stream, after its junction with that of the Kinree. The stream here flows through a rocky gorge about 300 yards in width, and an attempt has evidently been made to bund up the whole of the intervening space. Traces of bunding are visible on both sides, but that on the right bank appears to have been carried out to a greater extent than on the other, advantage having been taken in both cases of the natural rock, which forms a buttress or support to the remainder of the work. The breadth of the right side of the stream cannot be less along its base than 100 feet, the height being at least 60 or 70, and the amount of labour requisite to carry this along the entire breadth of the gorge may be estimated, when it is remembered that the work is not constructed of mud or gravel alone, but that the exterior of it is faced with large stones, many of which would require the joint efforts of a couple of men to lift. Not more than 150 or 200 feet in length remain, the probability being either that the work was abandoned altogether in consequence of its magnitude, or that the strength of the current, which, judging from the manner in which it has cut a way for itself through a very hard stratum of rock, in the neighbourhood of the bund, must be very great, carried away the work before it could be completed.

The method adopted in constructing both this and the generality of bunds which I have seen appears to have been as follows:—Two
Supposed method of construction. walls having been built, parallel to and at a distance from each other of 10 or 12 feet, the interior space was filled up with gravel and small stones, bound together with mud: these walls were then strengthened by stones being piled up against them on the outside, and larger stones added as the work proceeded, the whole then serving as a foundation for a further addition being made to the height and breadth of the proposed bund. Several of these parallel lines of walls must have been necessary before the requisite breadth could in many cases have been attained.

From the stony and barren nature of the soil in the immediate neighbourhood of many of these embankments, it may be conjectured
Probable purpose for which constructed. that their construction had reference more to the daily wants of the inhabitants than to any purposes of cultivation; that they were, in fact, intended to form artificial reservoirs of water, to be made use of in seasons of drought.

A fine plain, of apparently excellent soil, would certainly have been brought under cultivation had the bund referred to above been completed, but, with this exception, little use could have been made of the supplies of water thus collected, except for the purpose already alluded to.

The next work of this nature which seems from its size to be deserving of notice is not situated exactly in the Choota territory, but is a little to the

north of the Moosefuree Luk. In length it is about a quarter of a mile, with an average breadth and height of about 100 and 30 feet respectively; and here, also, the stony nature of the ground in its neighbourhood precludes any idea of its having been constructed with a view to irrigation. The exterior of the bund is roughly strewn with very large stones, and an opening has been effected towards the centre of it by a small stream, whose apparent insignificance would not seem to imply sufficient power to break through a barrier of such strength and magnitude.

As might be expected, the construction of these bunds is attributed to Kaffirs, who, according to a prevailing tradition, determined in the hardness of their hearts to build such bunds that no stream should be able to carry them away. Allah, however, to use the words of my Choota informant, was too strong for them, and caused a stream to flow which soon swept a way through their boasted bund.

In conclusion I would beg to observe, that the sketch map appended hereto has no pretensions to accuracy. It is intended merely to show the relative positions borne towards each other by the various places mentioned in the memorandum, and from the method adopted in framing it, from a series, namely, of sketches of the surrounding country made from the tops of the highest hills, it cannot be considered as giving anything more than a very general idea of the country so represented.

C. J. STEUART.

*Appendix showing the Present Distribution of Clans composing the
Choota Tribe.*

MEMO.—The clans are arranged according to the precedence universally allowed them among the tribe.

No.	Name of Clan or Sub-divi- sion.	Name of Wuderoh or Headman.	Probable No of both Sexes composing each Clan.	Distribution.
1	Bootanee ..	Oomed Ali	25	No fixed residence; they appear to please themselves as to where they will reside, though the greater number will be found in and near Oomed Ali's village.
2	Nothane ..	Ullah Rukeeah.	80	Level plain between the Kund and Doorasse.
3	Seedikance ..	Jumal Khan ...	30	Only one village, at the base of the Bhedoor hills, and near the Talangah stream.
4	Marcho. . .	Taroo Khan. . .	250	Plain of the Talangah and Solanee, also at Vchrah; 9 villages.
5	Oothmanee ..	Chakur	300	On the right bank of the Hubb, opposite to the Kund, and between that point and Vchrah; 8 villages, 1 near the Mehee range.
6	Tooranee ..	Saleh	120	Between Vchrah and the Pubh hills; 6 villages; none on the left bank.
7	Bhikkuk ..	Jaffer Khan ...	250	To the south of Lakhah, and between that and Pubh, not so far south as Keyloo; 9 or 10 villages.
8	Gunjoh. . .	Deerach	50	Between the Kund and Bhor streams; 3 villages, 1 near the Kund chowkee.
9	Barejoh* ..	Ali Khan.	About 100	Greater part near the Sindree; villages may be numbered at 13; 3 on the top of the Mol hills. (Vide notes.)
10	Bhulool . . .	Hoth	180	Near the Bhaloor stream; villages 6 or 7.
11	Bundejoh†. .	Long	350	To the south of the Bhikkuks, and in a line from Loharance Luk, on the right bank of the Hubb; villages 9 or 10.
12	Bapreh. . .	Kakace	50	Live with the Bundejohs; villages 2 or 3.
13	Bakrahs ..	.....	150	On the right bank. Were formerly of the "Baraduree" of Oomed Ali, but appear to have subsequently joined the Jam of Beyla.
14	Shodas	Kulundur.	80	Near the Kund stream, 4 villages.
Total .			2,315	

* The Barejohs are essentially the fuqueers or professional beggars of the community; and, in conformity with this privilege, which is allowed them by the other clans, their haunts are not confined to any particular locality, but members of their family may be found scattered in various parts of the country, where they are supported by the charity of those among whom they introduce themselves; or a larger number of them, assuming the character of a society, may be found incorporated with, and forming part of a permanent village, the chief members of which belong to another clan.

† The Bundejohs, though included in the above list, are not, strictly speaking, so closely allied to the Chootas as the other clans. They are described as siding with no particular party, but lending their allegiance to whichever side may prove strongest, and both they and the Gunjohs may probably be referred for their origin to the Brahmins.

[MEMO.—In framing the above list, considerable deductions have been made from the numbers originally given me as those of which each clan consists. This has been done in accordance with my own observation, which leads me to consider that they were greatly overrated, and the probability is that Oomed Ali would find it difficult to muster more than two or three hundred men capable of bearing arms.]

SELECTIONS FROM THE RECORDS OF THE BOMBAY
GOVERNMENT.

No. VI.—NEW SERIES.

P A P E R S

ON THE

CONSTRUCTION OF TANKS FOR
IRRIGATION.

BY

CAPT. M. TAYLOR AND CAPT. BUCKLE.

PUBLISHED BY AUTHORITY,

H. GREEN,

COMPILER & EDITOR OF THE SELECTIONS FROM THE RECORDS.

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1854.

PAPERS ON THE CONSTRUCTION OF TANKS FOR IRRIGATION.

EXTRACTS FROM A LETTER FROM CAPTAIN E. BUCKLE TO GENERAL FRASER, IN REGARD TO THE FIRST PRO- POSAL OF THE KUCHACKNOOR TANK BY CAPTAIN TAYLOR.

2. With reference to the proposed tank at Kuchacknoor, nothing can be more favourable than the features of the adjoining country, as described by Captain Taylor, and as delineated in that officer's plan of the country; but as the supply of the tank is restricted to the rain which may fall within a district of 7 square miles, it must fluctuate greatly.* Making the average fall of rain to be 30 inches, and assuming half that quantity to be retained by the tank, and made available for cultivation, it would afford irrigation for about 2,000 acres, which I suppose may be considered equivalent to a revenue of Rs. 12,000. In the absence of other data, I offer this as an approximate basis of calculation for comparing the cost with the returns of the undertaking.

4. With regard to the executive details of the work, Section No. 2, as proposed by Captain Taylor, is decidedly the best. It allows a breadth at top of 15 yards, where the bund is highest, giving the interior slope, which is to be faced with rough stone, a base equal to the height, and the exterior slope, where the soil will rest at its own angle of repose, a base equal to one and a half times the height. Three times the height would, however, have been a better proportion.

5. With an embankment of the above description, it is practically a matter of no consequence whatever whether its description be perfectly straight, similar to the Hussein Sagor Tank at this station, or whether it curve inwards or outwards, or both: the configuration of the ground will best regulate these details.

6. The rate assumed for earth-work in the estimate appears to be such as

* Captain Buckle, as he subsequently stated, had mistaken the scale of the map: the tank would have the drainage of 140 square miles.—M. T.

it might fairly be executed at ; but there is an item for ramming down and consolidating the earth as it is thrown up. For this an addition of one-third is necessary to this part of the estimate. But in the estimated quantity of stone-work there is apparently a considerable error of excess, its thickness being entered at double the correct amount. It is intended that the facing throughout shall be 1 yard thick at top, and increase in thickness towards the bottom, so that, for instance, when the bund is 15 yards high, the facing will be 3 yards thick at bottom ; its greatest average thickness would therefore be 2 yards instead of 5 yards, as entered in the estimate, and so on in proportion along the whole bund. On the other hand, the rate of 7 cubic yards per rupee for stone-work appears to me remarkably low, as this includes not only furnishing the materials, but building it up to the proper angle—an operation that becomes laborious and difficult as the work advances.* I may add here that no foundation is necessary for tank facings beyond a footing of two layers of stone ; the facing never fails from a defect of foundation, but from the settling of the soil at its back. The estimate for the minor works of sluices and escape-weirs do not call for any remarks.

7. In conducting the execution of the work, it may be noticed that the bund should be carried on from the extremities towards the centre, leaving the closing of the nullah as the last operation ; in doing this, care should be taken to remove the sand entirely, if possible, from the part where the bund crosses it, otherwise the tank will leak, or probably be undermined there. It is also advisable to build a solid wall along the front, where it is opposed to the direct action of the stream. This is sure to prove the weakest part of the bund, and in hill tanks, where the streams fill very rapidly, the water sometimes accumulates at this point, and overtops the bund before it has time to distribute itself over the basins of the tank. On this account, the level of the top of the bund here should be fully 12 feet higher than what is intended to be the high-water line of the tank. Along other parts of the bund, half this height will be sufficient. I may further observe, that the tank may be made available for cultivation before it is fully completed, by having passages for the escape of the overplus water at each extremity of the bund, proportioned to the progress of the work, and which may afterwards be built up to their proper or intended height.

In conclusion, I may state that the project appears to be one of great promise. The estimate bears a fair proportion to the benefit expected, and appears to be such as the work might be executed under. I am not so sanguine as to suppose the work could be completed in two years, but this is of little importance. It should be recollected, also, that the returns from a new work like this are always very gradual, and such as often to disappoint the

* The rate was finally settled at 8 cubic yards per rupee, including building, &c.; earth-work at 20 cubic yards per rupee.—M. T.

projectors ; for it takes a considerable amount of agricultural labour and capital to prepare new lands for wet cultivation ; but all such difficulties are overcome by time and management. The only material point to which I think Captain Taylor's attention need be drawn is that of satisfying himself of there being a sufficient hollow above the site of the bund for the retention of the supply at its assigned level. I am not inclined to suspect that the reverse of this is the case, but its possibility should be looked to beforehand.

(Signed) E. BUCKLE,
Superintending Engineer.

Secunderabad, 2nd July 1851.

REPORT ON PROPOSED TANK AT JEWURGEE.

From Captain M. TAYLOR,
On Special Duty, Shorapoor,
To Major General FRASER,
Resident, Hyderabad.

Camp Jewurjee, 10th May 1851.

SIR,

In reference to my former communications in regard to new tanks in the Sumusthan, I have the honour to bring to your notice that a large one may be constructed at this village, with apparent profit to the State, and at comparatively little cost, considering its size, owing to the natural advantages of the situation.

2. The nullah or river I propose to dam up is a considerable one, and, as you will observe by the Survey Sketch No. 1, has an ample supply of water in the drainage of about 64 square miles. The several branches originate in the high lands of Ijeyri, &c. and join before reaching the village of Ouradi.

3. Below Ouradi, the nullah flows on in an easy descent, and at the point I have selected for the bund, the ground on each side rises into natural elevations, which decline to the north and south, along which the bund will be carried, having a considerable part of low land to the north, which will be filled with water. The Survey Level No. 3 will show you the natural slope of the valley on each side of the point alluded to.

4. The bed of the nullah is bare limestone rock, and the same rock continues up each side of the valley from one yard to a yard and a half below the surface soil. I have satisfied myself on this point, by having holes dug at intervals along the crest of the ridge selected for the bund. The rock, therefore, affords a secure foundation for the bund, for the whole length, including the nullah, where the greatest pressure will occur.

5. The rock also affords an admirable natural advantage for the formation of the escapes at each end of the bund, for the surface earth being cleared away down to the rock at the highest water level, and for a sufficient breadth, the surplus water would flow over the rock itself in its natural declination to the north, and would join the main nullah at points below. There would be no danger of the nullah being affected by the surplus water, as the same stratum of rock continues to the village of Jewurgee, sometimes at the surface, sometimes a little below it.

6. The slope from the proposed bund towards Jewurgee is also eminently favourable on both sides of the nullah. The watercourse from the sluice would pass over solid rock between the points B and D of Sketch No. 1, with a fall of 33 feet in 1,970 yards from the escape, or end of the bund. After reaching the point near the south-east corner of the village of Jewurgee, the slope to the north-east is still more favourable, and the whole of the area between Jewurgee, Bootinhal, and Chennoor, and, indeed, to the Bheema, could be irrigated. The land here is of fine quality, and suitable for sugar-cane, rice, or any other valuable cultivation. The eastern stream from the tank would divide into two before it reached Jewurgee; the main stream would run to the south-east of the village; the other to the west and north, irrigating the land along the bank of the nullah, which is now used for garden cultivation.

7. The stream from the west side of the tank would pass the village of Jewurgee Khoord, irrigating the land down to the nullah, and after crossing a small tributary nullah at its proper level, would follow the northern or left bank of the main stream, as shown in the sketch, on which the land is of excellent quality also.

8. According to the village register of Jewurgee, the irrigable land stated in paragraph 6 is rather more than 1,000 beegas, and, including the land on both sides of the nullah from the sluices, the whole amount which is capable of being irrigated is at least 1,500 beegas, the whole being of fine quality, at present under dry and garden cultivation.

9. Land now irrigated, partly by throwing a temporary dam across the main nullah, after the rains, when there is a good running stream for four months, and partly by wells, pays rent at the rate of Rs. 7 per beega for sugar-cane, &c. and the people of the villages around have assured me that if certain irrigation were provided them, the land would produce this amount or more per beega. As Jewurgee is a large and populous village, and there are several others in its immediate neighbourhood, there is no fear that the land would not be taken up, as the certainty of return from irrigated lands makes them subject of much competition in this district wherever they are situated.

10. There being no doubt, therefore, as to the occupation of the land, and its amount, the only question is as to the supply of water in proportion to the land; and on this point I regret that I have no standard for computation,

and have omitted to put the question for Captain Buckle's consideration in my former letters.

11. I have, however, taken the level of the tank from the highest water level, as given in the elevation of the bund, carefully with a theodolite, and find that the area (vide Sketch No. 2) is about 3,750,000 square yards, which, allowing an average depth of 4 yards, gives 15,000,000 cubic yards of water. Did I possess any data as to the general expenditure of water per beega or per acre per annum for irrigation, it could at once be seen how many acres or beegas the tank would supply; but should you do me the favour to refer this communication for Captain Buckle's consideration, I would beg his kind attention to this point, as a full understanding of it would render mistakes impossible in any future calculation or proposal regarding new tanks.

12. Judging from the eye, however, and the depth of water, I should consider that the tank would be fully equal to the irrigation of at least from 500 to 600 beegas, which, at the rate assumed, would afford a fair return on the amount to be expended. The level taken by me is, however, lower than it might be by 6 feet, and should, as I consider would be perfectly practicable and advantageous, another 6 feet be added to the bund, as calculated in the supplementary estimate, the area would be very considerably increased, as well as the depth of water by 3 feet, and the running water, which continues to flow freely in the nullah till the month of March, would go far to supply the evaporation. From October to January the stream is considerable, and would, I am of opinion, of itself form a supply equal to one channel for irrigation.

13. I am of opinion there would be no doubt of a full water supply even at the increased level; indeed here, as at Kuchacknoor, there is more apprehension from an over-supply than a short one; but by arranging adequate escapes, in proportion to the size of the river at flood, I should not anticipate danger; and as I have remarked, the natural advantages in regard to the rock beneath the surface on each side are very great.

14. The amount of land to be submerged, and which would belong to Jewurgee Khoord and Ouradi, is 1,329 beegas according to village estimates, and the rent now paid to the Sirkar is in Ouradi Rs. 104; in Jewurgee Khoord Rs. 20; total Rs. 124.

15. The greater portion of the Ouradi land is covered by date trees, and is uncultivated. The loss to be expected from these is about Rs. 200 per annum. The cultivated land is generally of poor quality.

16. Materials for the construction of the tank are abundant. The earth is of a stiff clayey quality, but easily dug. On the west side of the valley the trap hill affords large trap rocks, which can be removed without difficulty, as they lie on the surface, and are not too large for the purpose. On the west side laminar limestone rock can be raised at the surface close to the bund,

and is readily broken by the wuddawars into blocks of any size required, about 8 to 12 inches thick.

17. In the Sketch No. 1 you will observe another site of a tank laid down in the ravine leading from Ijeyri, and this I should propose to construct, should the supply of water prove much in excess of that required for the large tank. The expense of this tank would not exceed Rs. 5,000, as the ravine is narrow where the bund would be. Below the tank there would be a large extent of land belonging to Ouradi and Hulgudli, of superior quality, and the whole of the villagers are as anxious to have water for irrigation as those of Jewurgee. Materials also in stone (trap rock) and earth are most abundant, and easily worked. The Ijeyri branch of the nullah has always a small stream running through it.

(True extract)

(Signed) M. TAYLOR,
On special duty.

From Captain BUCKLE,
Superintending Engineer, Hyderabad Subsidiary Force,
To Major General FRASER,
Resident, Hyderabad.

SIR,

I have the honour to acknowledge the receipt of your letter of 27th instant, together with the communication from Captain Meadows Taylor, which accompanied it, suggesting the construction of a new tank near the village of Jewurgee, in the Sumusthan. These papers I have carefully perused. The representation made of the features of the country, on which the success of the project depends, are eminently favourable to it; but the report would have been more complete could a series of levels have been given from Ouradi to the site of the bund, and two or three cross levels at right angles with such a line. However, as the fall from D to B is 33 feet in 1,970 yards, perhaps the fall from Ouradi to D is less than this, though the distance is nearly twice as great. Of course, unless it is so, the water could not be retained, as proposed, for the whole height of the bund is only calculated at 33 feet, and it would not be safe to retain the water within 9 feet of its crest in the centre. The ordinary obstacle to the construction of tanks in hilly situations is the difficulty of finding a suitable basin, the land falling too rapidly.

2. I agree in opinion with Captain Taylor, that the supply of water in ordinary seasons promises to be abundant, and as the bed of the tank is said

to be underlain with limestone, there would be little probability of the project being defeated by leakage, an event I have known to occur.

3. The proposed sections of the work and provisions of sluices and escape-weirs appear suitable, and the estimate for them sufficiently accurate, though I apprehend it may be found not quite equal to the whole outlay. The top of the bund should be coated with gravel, both for its preservation, and that it may be available as a road. Some provision, also, is necessary for the extensive irrigation channels.

4. The very small quantity of cultivated land which will be sacrificed by this work is an unusual advantage; and as the ryots of Jewurjee seem familiar with wet cultivation, the resources which it is proposed to open to them would probably be rapidly availed of to a considerable extent. But in the Company's territories this has usually been observed to be a much slower process than might be expected. In considering the advantages and disadvantages of the work, of course the claims of any existing channels from the nullah or tank, drawing a supply from it, have been regarded.

5. The information which Captain Taylor in paragraph 11 expresses a desire to obtain I can easily supply. Rice cultivation requires a cubic yard of water for a square yard of land: this is the simplest practical rule that can be given. Another calculation is, that an acre of paddy requires a constant flow of two cubic yards of water per hour for a hundred days. This amounts to the same proportion as the first within a minute fraction. Colonel Cautley, at the Dooab Canal, computes that a cubic foot of water per second is equal to the irrigation of 218 acres, or about 660 beegas. This also will be found very nearly to coincide with the rate above given, supposing that a perennial flow is understood.

6. Captain Taylor's calculation of the area and probable depth of the tank would lead to the conclusion of the projected work affording irrigation to 1,500 acres of land*; but what the assessment on this would be I have no means of judging, the Shorapoor beega being altogether different from the Bengal beega; nor do I know to what degree this land may be under dry cultivation, and what its assessment. Judging only from what is before me, this would appear to me a more profitable speculation than the Kuchacknoor project, but I should suppose that undertaking any one work of this description would demand all the resources of the Shorapoor district to complete it within two years.

I have, &c.

(Signed) E. BUCKLE,
Superintending Engineer.

Secunderabad, 31st May 1851.

* A Shorapoor beega is about one-third less than an acre; that is, a beega contains 3,364 square yards, an acre 4,840.—M. T.

EXTRACTS FROM A LETTER FROM CAPTAIN TAYLOR TO
MAJOR GENERAL FRASER, SUBMITTING ESTIMATES, &c.
FOR A TANK AT SIRWALL.

4. The nullah at Sirwall has, as you will observe by the Survey Sketch No. 1, which is enlarged from the trigonometrical survey map, a drainage of 82 square miles of country. Its sources are on the high lands of the Sumus-than beyond Gogi, and one branch of it already supplies two tanks at Gogi, which are in repair, and are used for irrigation. The remainder is ample for a very considerable, and to some extent permanent, supply of water to the new tank at Sirwall.

5. I now beg your examination of the Plan of the tank and bund No. 2. You will observe that the nullah, after passing the village of Itgi, follows an irregular course to the north-east, until it reaches the point A; thence east to B, where it suddenly turns nearly due south to C, and then again north-east by the village of Sirwall. At the points C and D the stream is turned by a rocky elevation, the summit of which is about 50 feet above the bed of the nullah, and at C the rock rises with a steep ascent to the height of the elevation above A and B, so as to render comparatively little work necessary at this end.

6. From the north end of the bank, the slope is gradual to the bed of the river at C D, while the rocky portion E E, including the bed of the nullah, not only furnishes an admirably secure foundation for the bund, but actually contributes its height above the river to the bund itself, as well on the north as on the south side of the river, leaving only the aperture of the channel C D to be filled up to the level determined, and that level to be carried on to the extreme point.

7. Another advantage appears to me observable from the course of the nullah. When a bund is constructed at right angles with a stream, it must necessarily follow that a great force and pressure of water, when the nullah is in flood, must occur at first at the point crossed by the bund; but in this situation the direction of the current of water from B to C would be parallel to the bund, and the force of the current would be first expended against the rocky elevation above C. After the water should rise above the level of the ordinary bank of the nullah, the force of the current would be directed against the hill above A B; and thus I consider that while the distance from A to C gives ample room for the subsidence of water to its proper level, there would be no pressure from the current on any part of the bund.

10. The land to be irrigated will depend in proportion, of course, to the water which is secured in the tank. At the lowest level, Estimate No. 1,

the whole of the land on the left side of the nullah down to the Bheema, which amounts to upwards of 600 beegas, to which water could be directed from Sluice No. 1, could be irrigated ; and it is possible, also, from the natural supply by the nullah during four months, that another channel, taken from the Sluice No. 2 to the south of the village of Sirwall, would afford a supply for another tract of irrigated cultivation on the right bank. This, however, would be dependent upon the result of the drain from the Sluice No. 1. The slopes of the lands on both sides of the nullah down to the Bheema, and even to the village of Hoorus Goondugee, are most favourable, and on the right bank of the lands of Sirwall and Hoorus Goondugee could be irrigated to a very great extent.

11. Advocates the higher estimate of the two, on account of the large addition of water.

12. Material is most abundant : earth of a very firm quality is dug from the opposite side of the nullah. It contains a large proportion of white lime (kunkur), and binds readily and strongly. Besides the limestone rock of the locality, which is raised from its beds in blocks or slabs as required of 8 to 12 inches thick, there are a great number of ruined and unfinished temples near the spot, and blocks of granite and limestone squared by the chisel, which have been brought from a distance, and at immense cost. These being of no use to any one, I have employed them in the work going on. Many of these blocks of granite, which have been brought from 8 to 10 miles distance, are 10 to 12 feet long, and $1\frac{1}{2}$ foot to 1 foot square, and are invaluable for the foundations and facings of the bund. Indeed, the presence of this costly and readily prepared material, which could be applied to a useful purpose, mainly influenced me in deciding upon the small bund or weir for the usual stream, which can be so easily and profitably extended.

13. The escapes or calingulahs of the tank have now to be considered. It is most probable that in an ordinary monsoon there would be a greater supply of water from the river, notwithstanding the depth of the tank, than it could contain, and therefore outlets must be provided, equal or superior to the amount of water passing a given point in the river, a yard in breadth.

14. The highest flood level remembered by any one of Sirwall or Itgi gives a breadth of 160 yards, with a depth of 6 feet. This would give a stream of about 120 cubic yards of water, or say 400* cubic feet, for which escapes should be provided in case of emergency.

15. The facilities for arranging this are very great. On both ends of the bund the solid rock is met at 2 feet from the surface. The surface soil being removed, therefore, and one layer of the laminar rock, which lies in horizontal strata, or as many as might be required to reduce the level by 1 foot per 150 yards on each side, would suffice ; the excess of water over this being already provided for by the excess of the bund over the water level. (Vide Plan No. 4.)

* See in original, a mistake in copying.—M. T.

16. The bund being carried along a ridge, the slope of the rock towards the tank and backwards is about equal, and while this slope secures the escape of the surplus water, the solid rock prevents any chance of the ground behind being undermined; and the surplus would fall into the old channel of the river below the bund from each calingulah.

17. If the bund were carried up to the highest level, as per Estimate No. 2, the facilities for the escape of the water surplus would be even improved; for at that level the south end is near a natural watercourse, which falls rapidly down the elevation to the river, into which the surplus water could be directed; and on the north end there is no difficulty, as the rock continues the same as at the lower elevation, with an equally advantageous fall. There is no masonry of any kind required for the calingulah on either side, the natural rock being level, firm, and smooth, and in every way suited to the purpose.

Paras. 18, 19, 20 relate to details in the estimate of no material consequence.

21. The return of the tank may be estimated as follows:—

At the lower level, Estimate No. 1, 600 beegas of land, at Rs. 7 per beega for the first four years, Rs. 4,200 per annum. Afterwards the land would bear a higher value, and as far as Rs. 10 per beega, or even more, in good spots for sugar-cane and rice cultivation.

22. If the higher level were determined upon, the increase would be in proportion, but to what extent I am unable to state, from having no data on which to calculate the expenditure of water per beega; but there is no doubt that land to a greater extent than on the left bank of the nullah can be irrigated on the right; and allowing that between the two the tank was equal to the irrigation of 1,000 beegas, at the same rate, the returns to be expected appear to bear a fair proportion to the capital employed.

Camp near Shahpōor, 11th June 1852.

From Captain BUCKLE,
Superintending Engineer, Hyderabad Subsidiary Force,
To Major General FRASER,
Resident, Hyderabad.

Dated 28th June 1851.

Para 2. The Plan No. 1, showing the basin of the Sirwall nullah, affords satisfactory evidence of the supply of water by that stream being equal to the demands of a large tank, and the report discusses the eligibility of constructing a large tank at the cost of Hyderabad Rs. 15,000, or a very large one at double the sum.

3. The former project contemplates a depth of 28 feet of water along the deep bed of the tank, the latter a depth of 40 feet in the same part. The smaller tank would be clear of the village of Itgi, the larger would encroach upon it.

The evaporating surface of the larger tank would be double that of the smaller; but the relation of the cubic contents of the one to the other cannot be determined in the absence of cross levels. The area of the bed of the smaller tank appears to be about 500 acres, and the irrigation under it might amount to 1,000 acres, or 1,300 Shorapoor beegas. The assessment on the latter is rated at Rs. 7,500, on which computation the outlay on the tank would be defrayed by two years of full cultivation, or, allowing favourable cowles for clearing and preparing the land, the expenditure would be reimbursed at the end of five years. Under the prospect of enlarging the tank, it will be advisable to make the stone facing 2 yards thick at top, as this will admit of an additional height of 5 or 6 yards being given to it without difficulty. I may again call attention to the circumstance of a stone facing not being a rivetment, but merely a protection against the action of the waves. Instead of yielding support, it requires support, and there is no advantage in making the thickness at bottom more than 3 yards, or the thickness at top more than 1 yard, the slope forming an angle of 45° . It is preferable to build the facing in steps rather than with a smooth surface, as this forces the tank diggers to select their material. The cut stone mentioned in paragraph 12 of the report would, I think, be out of place in the stone facing: it might be well to reserve it all for the sluices and calingulahs.

6. The advantages derived by the tank in its bund running parallel with, instead of perpendicular to the stream is, as Captain Taylor points out, a very considerable one. It will not be possible to calculate the dimensions of the calingulahs from the section of the nullah, as adverted to in paragraph 14, unless the velocity of the stream were also ascertained at the same time; but it may safely be assumed that two calingulahs 150 yards, or even 100 yards each in length, as suggested in paragraph 15, and on the level shown in Plan No. 4, would be sufficient to relieve the tank in case of floods after it was filled.

7. In paragraph 14, the oversight has been made* of considering 400 cubic feet as about the equivalent of 120 cubic yards: the figures should be 3,240 feet; but this is of no practical importance.

8. If eventually it should prove expedient to raise the bund so as to contain an additional depth of 12 feet of water, I may point out that the crest of the bund ought to be 3 yards clear of the high flood level, although 2 yards may be sufficient for the smaller work: in raising the bund, the object is to secure it from being washed over or injured by waves during storms, and waves are proportioned to the depth of water and the distance they traverse.

9. Deep tanks are certainly preferable to shallow ones; but no tank that affords a depth of 15 feet of water can be considered shallow, and the Sirwall tank on the lowest scale is computed to contain 28 feet of water.

10. The estimates for the tanks have been carefully prepared, and are likely to be found adequate, as the stone facing may be reduced one-third of that provided for.

* It was a clerical error.—M. T.

11. There is one point of great importance relating to the sites of tanks which I have not seen noticed in the reports on those proposed to be constructed in the Shorapoor State, and that is in their soil; but I presume that none of those contemplated lie in black cotton soil, as their beds would otherwise soon fill up, and the ploughing for wet cultivation in this soil is found destructive to cattle. Such tanks are usually soon abandoned.

12. The only difficulty I experience in offering a definite opinion upon the merits of the site selected for tanks by Captain Taylor, arises from the absence of more detailed and well ascertained levels*; for, presuming that the soil is of a description which can be traversed without being extensively dissolved by water, and is adapted for the plough when under irrigation, the different positions recommended for embankments appear judiciously chosen, and the details of construction well arranged. I have made such remarks as appeared necessary in this and former letters on details connected with stone facings, the height of bunds, and the dimensions of calingulahs, while at the same time the estimates are sufficiently exact for the purposes to which they are intended to apply.

(Signed) E. BUCKLE,
Superintending Engineer, Hyderabad Subsidiary Force.

EXTRACTS FROM CAPTAIN BUCKLE'S LETTER TO GENERAL FRASER, 18TH MARCH 1851, ON THE SUBJECT OF THE KUCHACKNOOR TANK.

A remark in paragraph 2 of this report inclines me to think that the concluding observation of my letter of 2nd January may prove deserving of careful investigation. Captain Taylor speaks of the Kuchacknoor river "as flowing 12 inches deep, and 3 yards broad, with a strong current." Assuming the rate of current to be nearly 2 miles per hour, the fall by computation would amount to 16 feet per mile, at which rate the water would attain 32 feet at the bund, when the bed extended only 2 miles.

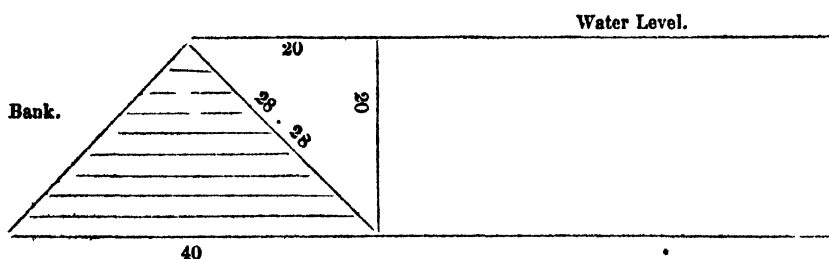
The contribution of this stream during the drier months at the rate above given would amount to 84,000 cubic feet per diem, thus : $\frac{1}{2} \times 3,520 \times 3 \times 24 = 84,000$ cubic yards; but taking the area of the tank to be reduced to 6 square miles, and the evaporation to be only a quarter of an inch per diem, we shall have a loss of water amounting to cubic yards 129,066, thus :—

$$1760^2 \times 6 \times \frac{1}{144} = \frac{3097600}{24} = 129,066 \text{ cubic yards.}$$

* I had no instrument then.—M. T.

Or the loss by evaporation is half as much again as the supply by a stream 3 yards broad, 1 foot deep, and flowing at the rate of 2 miles per hour. I may add that the evaporation is probably stated at too low a figure, and if this stream has a more rapid flow than 2 miles an hour when 1 foot deep, it would indicate a still more rapid fall than 16 feet per mile.

This may be a proper place for offering some remarks on the subject of the dimensions of a weir for the relief of the tank. The area of the tank when full may be taken at 10 square miles, and it may be considered desirable to possess the power of reducing this 1 foot in depth in the course of twenty-four hours, that is, to afford the tank a capacity of discharge of 835,752,000 cubic feet of water in twenty-four hours. To effect this, a weir 300 feet long and 4 feet below high-water level is necessary,* but considering the numerous feeders to this tank, and its general features, I should be disposed to recommend two such works of outlet, one at each end of the bund. I may further remark, that a weir of one-half the depth, or 2 feet, would discharge only one-third the same extent of water. The next point on which I may offer a remark is that of the stability of an earthen bank as opposed to the pressure of water, and a reference to the subjoined diagram and calculations will show that an earthen bank offers a resistance more than two and a half times that of the pressure of the water against it when it rises to a point, and its sides standing at an angle of 45° :—



Specific gravity of water	1,000	
Ditto of earth	1,900	
28:28 Surface under pressure		20
10 Centre of gravity below surface..		20
<hr/>		<hr/>
282:8		400 contents of section.
1,000		1,900
<hr/>		<hr/>
282,800 pressure of water.		760,000 weight of bank.
P : W :: 282,800 : 760,000 ; or as 1 : 2½ nearly.		

* The weir will be 300 yards long, and have a capacity of discharge of 3 feet water, equal 2,700 feet. Captain Buckle's two weir escapes would give 2,400 feet.—M. T.

Whatever, therefore, is added to this, is merely on account of the subsidence of the earth-work, and the effect of storms, as well as of the elements, and accidents generally. It will of course be recollected, that loose earth occupies nearly half as much space again as when in its natural state, and that it takes years to consolidate, unless beaten down in course of construction. It is the more expedient, also, to do this in order to obviate the danger of fissures, and the burrowing of vermin.

With reference to paragraph 12 of Captain Taylor's memorandum, I may observe, that the additional pressure generated by a velocity of 10 feet per second would still be very far from equalling the resistance of the mere mass of earth, as noted above.

As regards foundations to the stone facing, I may repeat that nothing but a footing is required: its tendency is not to sink but to slide; it follows the changes which take place in the soil behind it.

EXTRACT FROM CAPTAIN BUCKLE'S LETTER TO GENERAL FRASER, DATED 30TH JUNE, ON A MEMORANDUM SUBMITTED TO GENERAL FRASER FOR CAPTAIN BUCKLE'S INFORMATION.

3. In estimating the returns from the tanks, I may draw attention to the circumstance of sugar cultivation demanding a larger consumption of water than rice.

4. I may observe in reply to what is stated in paragraph 3, that it is by no means indispensable to coat the tops of tank banks with gravel, but merely a desirable course when practicable. The exterior slope of the bank should also be planted with low shrubs, to protect the earth from being washed down: for this purpose the aloe is a useful plant.

5. With reference to paragraph 6, I am of opinion that with a smaller area of tank, larger calingulahs are not necessary; the calingulahs determined on being equal to the discharge of any body of water likely to be brought down by the feeders of the tank. If the calingulahs were supposed equal to preventing the level of the larger area from rising, they will be still more effective in regard to a smaller area.

6. When I assumed 6 square miles to be the probable area of the Kuchacknoor tank, the daily evaporation was computed at 129,066 cubic yards; but the present estimated surface is 2 square miles, at which rate the evaporation becomes 43,022 cubic yards.

7. A correction is also required for the contributions of the nullah in the

dry season. The latter on the former occasion was estimated at a breadth of 9 feet, depth 1 foot, and fall of 16 feet per mile: now it is given at a breadth of 9 feet, depth $\frac{1}{2}$ foot,* and fall of 12 feet per mile. This reduces the contribution from 84,000 cubic yards to 23,520 cubic yards per diem. The evaporation from the tank must be computed on its medium area of surface, but it cannot be safely assumed at less than 30,000 cubic yards per diem, which is in excess of the nullah's contribution during the dry season. It may, therefore, be sufficient to consider these two items of receipt and expenditure as balancing each other.

(Signed) E. BUCKLE.

OBSERVATIONS ON THE CONSTRUCTION OF TANK BUNDS BY CAPTAIN M. TAYLOR.

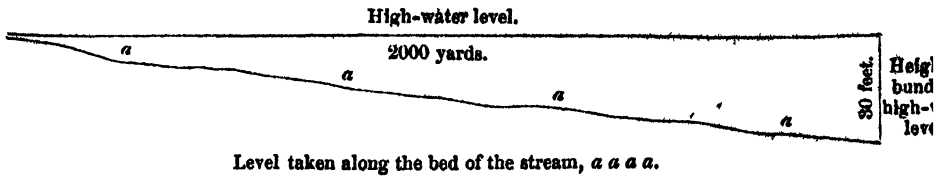
1. *The Site.*—This should always have reference to the sides of the valley which can be easiest joined together, and to the basin above it; also to the material on the spot. The less fall there is in the bed of the stream the better, and it frequently happens, that after a series of rather rapid falls a stream runs tolerably level for some distance, and falls again. This level should form the basin of the tank. If the fall of the stream should be over 12 or 16 feet in a mile, the height of bund required would be very considerable, and more expensive than where less fall and more basin, and consequently not so high a bund, were required. If a natural basin, as it were, is selected for a tank, it would hardly matter very much whether the land to be irrigated were close at hand or not: it might be at a distance of a mile, or even two, and the channels for irrigation being properly made and banked up, there would be very little waste of water.

2. Having fixed upon the site, the levels across the valley from point to point, or end to end of the proposed bund, should be taken. This is best done by a levelling instrument, or Y level, but it can be done by any Native Karkoon with a 10-foot mason's level, which is easily managed, and if there be not much wind is tolerably correct, and quite sufficiently so for any purposes of estimate.

3. There should also be some levels taken up the stream, till the level attained corresponds with the height of the bund, or the amount of depression

* There was a difference in the seasons as regards the water: Captain Buckle had assumed 16 feet fall per mile; the measurement by levels proved it to be only 12 feet. No rain had fallen in June, and the water was only half the depth it was in January. I suspect the January stream would be a fair average.—M. T.

of the valley, as taken from either end or side of the proposed bund, which will show—



the length of the tank, and two or more levels at right angles at any distances most expedient, which, with the level up stream, and that of the bund, will be data enough, not only to show the basin of the tank, but to calculate the amount of cubic feet of water or yards it may contain, which will lead to estimates of irrigation.

4. When the size of the tank and the length and height of the bund are decided upon, the bund can be marked out for execution, and an estimate made of its cost. This had better be done *from each end*, according to the fall in the ground.

5. Say that a spot is fixed upon as the highest water level of the tank on the side of the valley; then, assuming this as a starting point, there should be 5 or 6 feet bund allowed above this at the end, to continue all along the bund, and to be increased to 7, 8, 9, or 12 at the centre, or highest part, according to the size of the bund and tank, or the force of the stream. The annexed diagram may make this more intelligible.

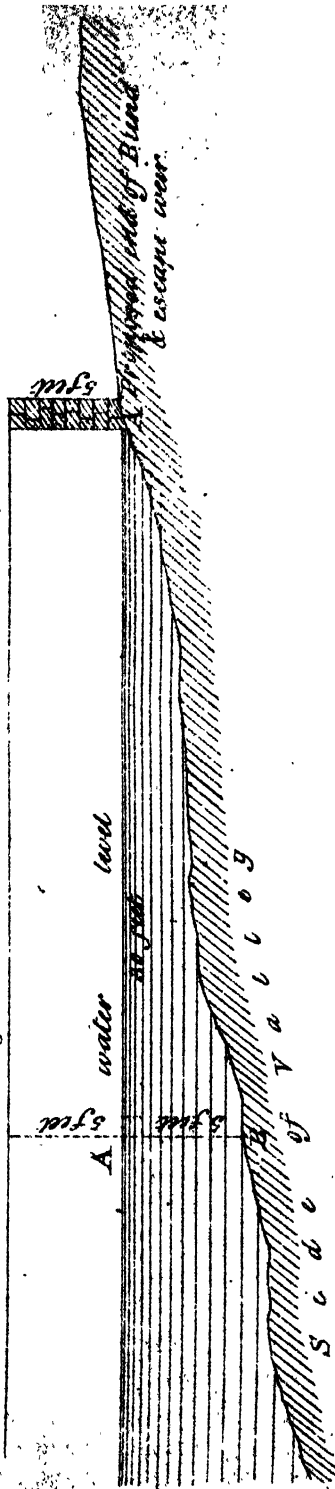
There is therefore a fall in the ground towards the stream of 5 feet in 30 feet. At A the bund would be 5 feet high, but at B it would be 10 feet; that is 5 feet from the ground to the water level A, and 5 feet above it; and so it would continue from each end of the bund, varying according to the ground to the centre, or wherever the place of greatest depression (that is the bed of the stream) might be.

6. The distance from each end to the centre may be marked off into portions, according to the ground, or in even portions of say 50 or 100 yards each. This makes the calculation of cubic earth and stone-work more easy, enables the shape of the bund to be marked out more correctly, and obviates any chance of mistake or irregularity.

7. Bunds of all kinds of shapes, and of every variety of thickness at base and top, are found through the tank districts of the Hyderabad country; but as a general principle, the following may be assumed as correct and safe data, and have been approved off by Captain Buckle :—

8. To a cube of the height required add in front half a cube, forming an angle of 45° , to face the water, and behind one and three quarters of the cube, with a slope up to the top. Thus, supposing the height of the bund, say at B

Top of Bund



gate

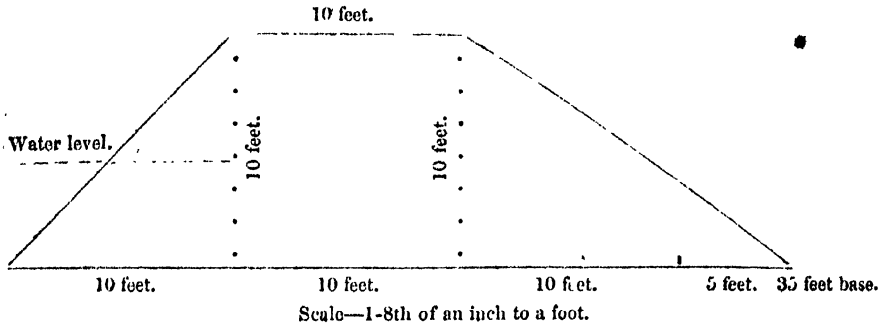
at junction with of Bund
& escape water

A

water level

Side of valley

of former diagram, to be 10 feet, then for the half cube in front 10 feet, and behind 15 feet, total 35 feet of base; and the shape may be thus illustrated :—

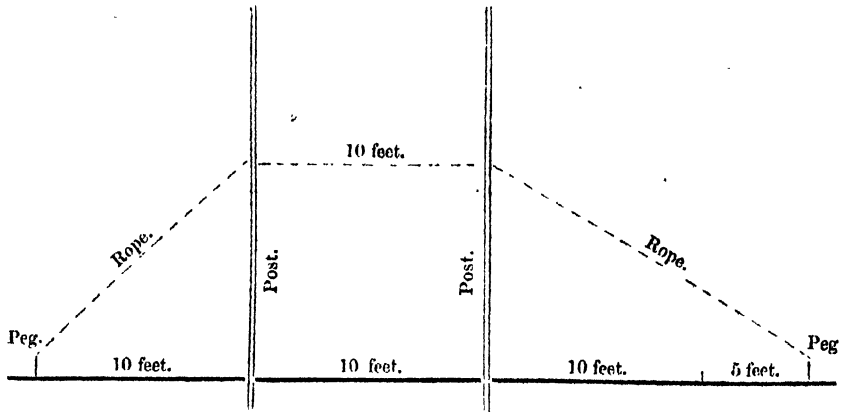


9. As this plan, if exactly adhered to, would give hardly sufficient roadway on the surface of the bund, where the height is insignificant, it may be as well to begin with 12 feet width at top, and proportional base, until, by the gradual increase of height in the bund, the proper roadway at once appears. Should 12 feet not be considered sufficient, 18 may be taken, which, when the height of the bund became 6 yards, would be the proper proportion for the top, and would require, of course, a proportionate base, on the scale given above.

10. Supposing, however, that the bund is very high in the centre, there would be no occasion to follow the rule exactly here. At top, for instance, if the bund were 50 feet high, the breadth of the top need not be more than 12, or at most 15 yards wide, while the *base* would require to be on the scale already laid down. By attending to this point, something may be saved in the cubic earth-work of the bund, and it is worth attention. Captain Buckle points out that the breadth at top gives no additional security whatever; the top might just as well be a point as broad; but having a broad top is useful as a roadway, and all superfluous earth, after a certain period, is washed down to the base, or settles itself in its natural angle of repose. The face to the water may be even at a more abrupt angle than 45° , but behind the slope should be as gradual as possible, not only on account of the greater base required (and secured by it), but because there is less chance of its being cut up by water-courses, or washed down by water from above.

11. On these data, the whole of the bund may be marked out by bamboos and string or rope. Two strong bamboos or poles are provided to mark the sides of the centre cube; the distance for the base is measured off, and pegs driven into the ground. String or rope is then fastened to the bamboos as they lie on the ground at the point of the cube, and when the bamboos are raised and the ropes fastened to the pegs, the skeleton of the bund appears perfectly, and has only to be filled up by the workmen. It is necessary,

of course, that the poles should be firmly let into the ground, and secured from moving.



12. If this plan is carried on all through the portions of the bund, the whole skeleton appears at once; but as the work should be carried on from the ends to the centre, it is, I think, better to set up the skeleton posts only as the "numbers" are wanted by the contractor or workmen, one or perhaps two at a time. Great attention should be paid that the work is done *quite* up to the highest level or the top of the bund, as this saves much subsequent trouble.

13. As each number or portion is finished, the levels should be ascertained by a 10-foot mason's level, both on the top and along the high-water line, as this serves, with the calculation from below the water line, to keep the work correct. The levels should of course be taken from the original points of departure.

14. *Stone Facing.*—The earth-work should be faced with rough stone, which prevents the action of waves or the water generally upon the earth-work. It is not necessary that the stone-work should be very thick, but the stones should be as large as possible, as they then settle by their own weight, and are not liable to be displaced. A small foundation is, I think, necessary: sufficient to hold two rows of stones one upon another is enough where the ground is pretty firm beneath; but if any portion is very soft, it would be advisable to dig down to the moorum or hard earth, and lay the stones upon it. The stone-work at the bottom should be 3 yards in breadth for the bund of an ordinary large tank, or for a bund which say measures 30 feet to the high-water level. In the low portions of the bund, 2 yards broad for the foundation might be enough, gradually decreasing to the higher portions. Supposing the base to be 3 yards broad, it should rise gradually, decreasing to 1 yard broad at top, which is sufficient for all purposes, though 2 yards is preferred by the Natives, or at least $1\frac{1}{2}$ yard. If it is proposed to raise the

bund afterwards, there should be stone-work of at least 2 yards broad left at the top, on which further superstructure can be raised.

15. The earth and stone-work may go on simultaneously if desired, and as is the general custom, but I understand it is sometimes the practice* to allow the earth of the bund to settle during a whole monsoon without any stone facing, and when the earth-work is being completed to the height &c. required the stone facing is done with it. By carrying on both works together, however, the constant passage of the wuddawars' carts loaded with stone over the newly thrown up earth, undoubtedly tends to consolidate it in a great degree, and as the wuddawars cannot build up from below, as masons, but drive their carts up the earthen mounds, from whence the stones are rolled down the slope to the men working below, all the stone necessarily passes over the earth, and with the result I have stated. I suspect it does not much signify which of the two systems is followed. Captain Buckle advises the ramming or beating down of the earth, which would be doubtless very advantageous, but very expensive. The Natives do not follow this practice, but allow the bund to settle well for at least two monsoons before the nullah is filled up and the tank filled. If the earth were beaten down as thrown up, I should think a tank might be ready the first year. It is of course most advisable to begin earth-work in the monsoon, when, being wet when raised, and constantly wetted by showers, it binds, and settles more firmly than it otherwise would.

16. Data will be found in my reports, and Captain Buckle's observations on them, for the formation of calingulahs or escape-weirs. They should possess ample breadth for the discharge of superfluous water, after the highest level of water in the tank has been attained; and unless a high safety portion of the bund is left, which will allow with safety one or two feet of water to remain temporarily till the proper level is reached, the escape had better be constructed so as to allow of no accumulation whatever, or as little as possible, say a few inches. Data for the length of the calingulahs may be obtained from a calculation of the water in the nullah when at flood, and the height (depth) and breadth of the water being given, and if possible its velocity, the amount of cubic feet to be discharged will appear from the calculation.† It is far better to be on the safe side, and to allow for a greater discharge of water by one-half than appears from the nullah; the calingulah, also, should be made as wide as possible, to admit of the water flowing over it in a shallow stream; for it is almost unnecessary to state that the more a volume of water is compressed, the greater is its force; and the shallower it is, the

* In the Madras Presidency.

† The section of the nullah at Kuchacknoor gave 2,250 square feet of water in flood; velocity allowed at 6 feet per second, or 4 miles per hour, discharge per second 13,500 cubic feet. A calingulah 600 feet long, and having a depth of 3 feet, yields discharge as follows: Velocity = $8 \cdot v = 8 \cdot 1.732 = 13.856$ feet per second. This multiplied by 600, and 3, the length and height, gives $13.856 \times 600 \times 3 = 24,941$ cubic feet per second; from whence it appears that the water would flow at hardly 2 feet depth over the calingulah.

less action it has on the masonry of the calingulah, or on the surface of the ground over which it runs.

17. Should, as at the tanks of Sirwall and Jewurgee, the escape-weir be made upon solid rock, there is no occasion for masonry, except at the end of the bund adjoining the outlet ; and where, for some little distance, it may be a rivetment, built with chunam or rough stone. The end of the bund is here the only object for precaution, as the water cannot disturb the solid rock. But should the place of escape be moorum only, or hard soil resting upon moorum, masonry would be necessary. In this case the ground should be dug out as deep as may be requisite, say one or two yards, and a foundation filled in with stone and gravel mixed with lime, and beaten down. On this the structure of the calingulah can be raised to the water level of the tank, or a little below it, say 6 inches ; but the water level is safe enough if the width of the calingulah be sufficient for the surplus water to flow off, say a foot or 18 inches deep, or even less, if it can be so arranged. As I have said, the shallower the flow of water the better, though there appears no danger as far as even 3 feet depth.

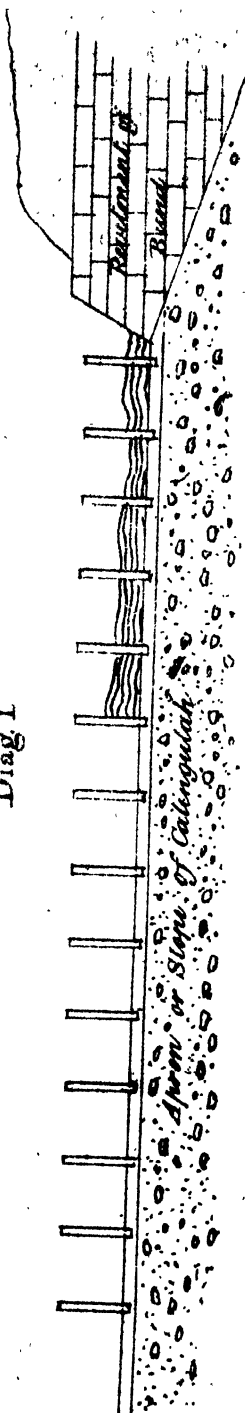
18. Most of the large tanks in the Hyderabad country have upright stones, about 5 or 6 feet high, built into the crest of the calingulahs at intervals of 6 or 10 feet. By these, into which branches are entwined, backed by mud or clay, a foot or more of extra water can be retained in the tank above the ordinary high-water level ; while, in case of any sudden flood, or pressure upon the high part of the bund, the whole can be cleared away in a few minutes, or is broken down by the water itself in flood. A diagram of this arrangement is annexed. (Diagram 1.)

This is a convenient plan, and if Natives are used to it, attended with no danger ; but after all, when the water level has been determined at the highest available point, it may be safer, on the whole, not to allow more water to be retained in the tank.

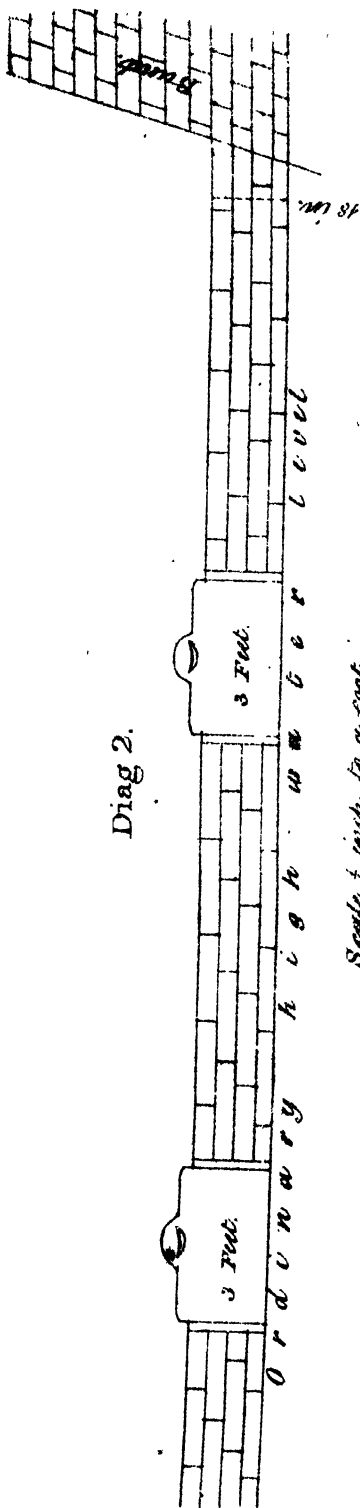
19. At Bohnal I have introduced another principle, which is to have sluices, or as it were embrasures, in the crest of the calingulah, 3 feet wide and 18 inches deep, which can be filled up with wooden shutters, for which grooves have been provided. (See Diagram 2.) These extend along the whole of the calingulah, at 3 yard intervals. When, therefore, the flood in the tank is gradually subsiding, these sluices can be shut *one by one* at intervals, corresponding with the diminished rush of water. When they are all shut, a small stream of water may flow over the top of all, till it gradually subsides. Should any extra flood follow, the shutters can be easily withdrawn, and relief given to the tank. By this arrangement 12 inches more water than before was retained in the tank this year without any risk whatever.

20. The apron or slope from the crest of the calingulah may be arranged in various ways. If on a favourable slope of hard ground, a pavement of large heavy stones, carefully laid into a bed of mortar, or, as is very often the case, without mortar, is sufficient. (See Diagram 3.) The length and slope of this

Diag 1

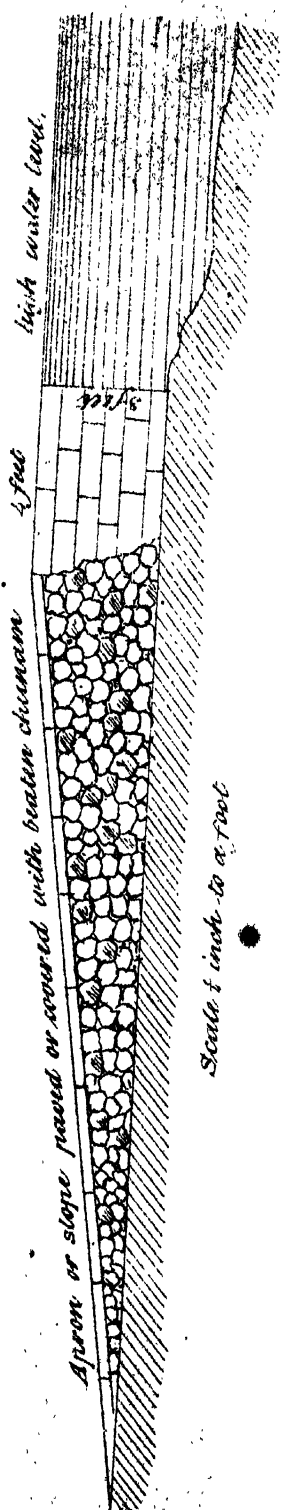


Diag 2.

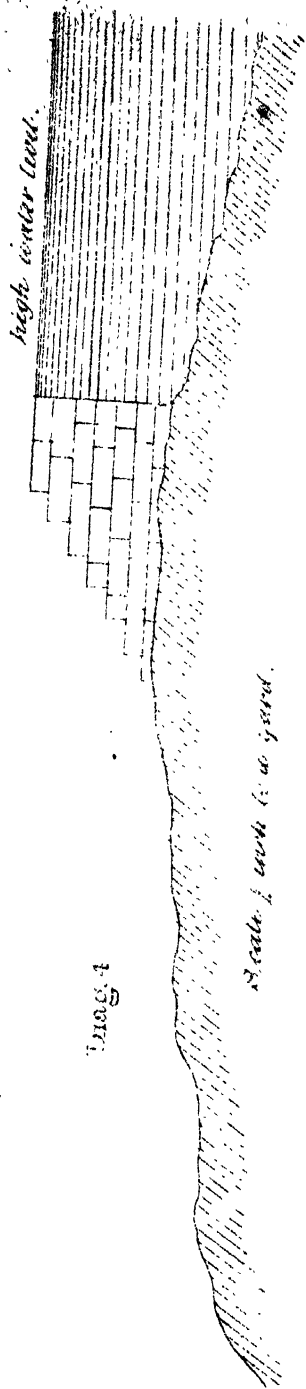


Scale 1 inch to a foot

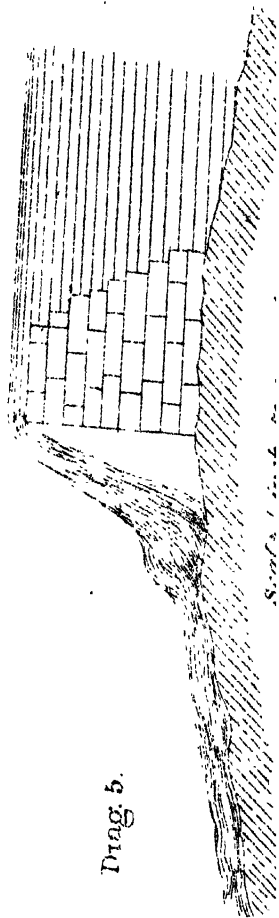
Diag. 3.

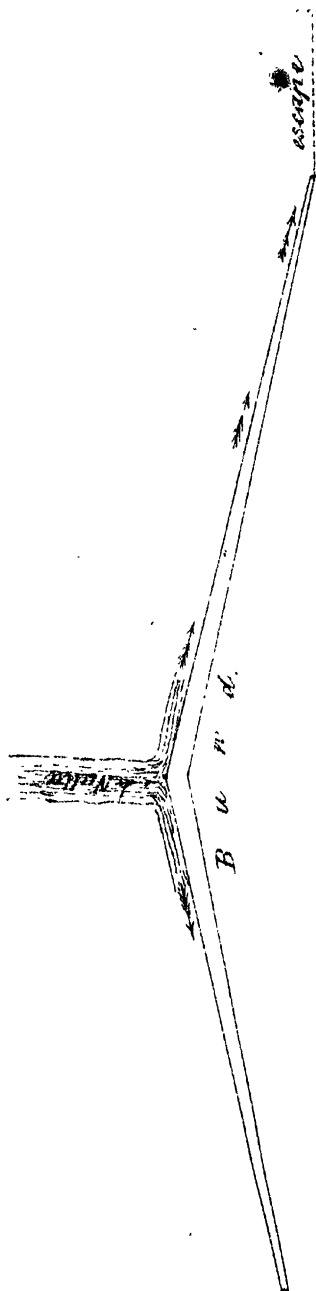


Diag. 4

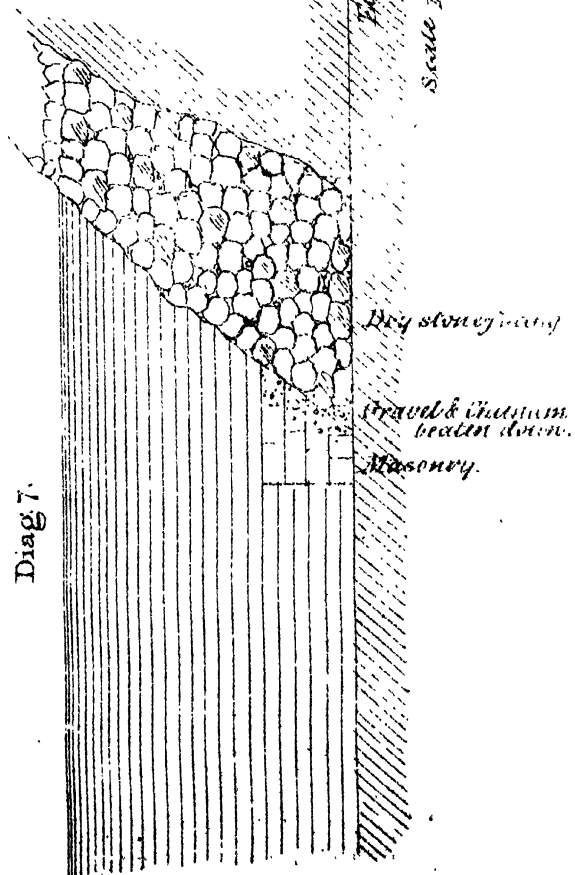


Diag. 5.





Diag 7.



Scale $\frac{1}{2}$ inch to a yard.

apron must of course be regulated by the ground, and by the height of the calingulah itself. If any natural hollow or nullah with a rocky bottom be taken advantage of, as an escape, the calingulah requires* to be built like a wall perpendicular to the water, and sloping off behind either in an apron or by steps. (See Diagram 4.) If in steps, the stone used requires no covering of chunam, but in an apron a covering is generally given.

21. Or if the ground in the latter case be *solid rock*, a wall of solid masonry is sufficient, without slopes behind, as the water, in the curved impetus of falling, falls clear of the base of the wall ; but with steps towards the water, in order to give a greater base and strength, of course the more water there is to flow over the crest, and to fall, the greater will be the impetus, and the further it will fall from the base of the calingulah wall. (See Diagram 5.) The two latter diagrams are applicable only to high calingulahs, or where the bund, being carried along adjoining eminences, the original channel of the main feeder of the tank, or that of some natural irregularity of rocky ground, may be chosen as the best place for the calingulah.

22. In regard to the shape of bunds, there seems to be hardly any rule, and in the largest tanks the ground itself is followed wherever a natural elevation gives assistance in the construction of the bund, without prejudice to the strength of the work. The bund of the Hussein Sagor Tank at Hyderabad, the largest and deepest tank I know, the water in it at high flood level being upwards of 50 feet deep near the main bund, which is more than a mile long, and the area above 2 square miles, is as nearly as possible straight. Bunds are also seen sometimes concave towards the water, sometimes convex. After much consideration on the subject, however, I have determined, in the case of Kuchacknoor and Jewurgee, to make the bund in the form of an obtuse angle, (see Diagram 6,) the point of which well meet the centre of the stream, and, as I conclude, divide its force, throwing off the water to each side ; and I would advise this everywhere that the nullah was perpendicular to the bund.

23. If with this shape of bund the precaution is taken of having the centre, or whereon the nullah meets the bund, higher than the other portions, I should think that it would be impossible for any water to overtop the bund and flow over, which is the cause of the bursting of so many tanks.

24. In some instances, the nullah comes into a tank obliquely, and in this case a straight bund is quite proper, or the bund may be irregular, and according to the natural advantages of ground ; but in the case above given, I consider that the water, after meeting the centre of the bund, should have a direction given it towards the escapes at each end (or at one end only). The water being turned by the angle, would run along the bund, exercising no force or pressure upon it beyond its own weight, and would find its way out of the escape.

25. It is very advisable, I think, in large tanks, that the bottom of this angle, and indeed the bund across the bed of the nullah, should be laid in with

chunam. This would prevent leakage, or the chance of the force of the current and pressure displacing any of the stones of the facing. Two yards high of such masonry across the breadth of the nullah would, I conceive, be quite sufficient, and would give great security to the work above. The work need not be of cut stone; rough stone, with the side edges smoothed, laid in with good mortar, and a backing of gravel and chunam concrete, well beaten down, would be sufficient for all purposes. At the back of this would follow the rough stone facing, and the earth as before shown. I shall finish the nullahs at Kuchacknoor, Jewurjee, and Sirwall, all of which are rock, in this manner. (See Diagram 7.)

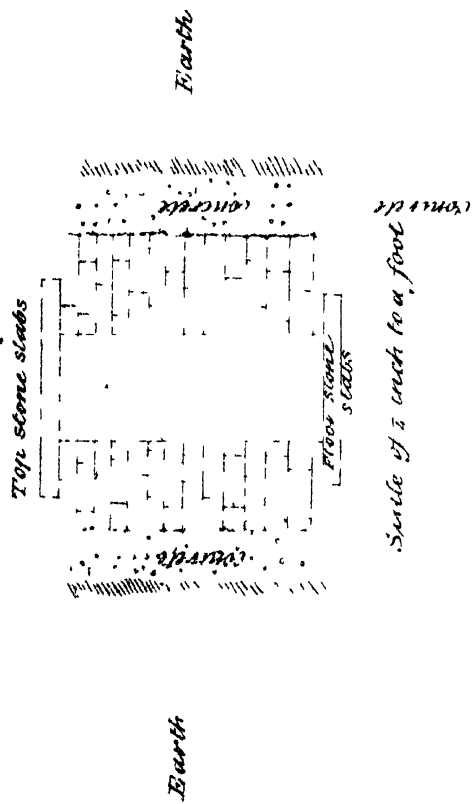
26. In regard to sluices, there is little to be said, as the Natives seem to understand them perfectly. If the tank is not very large, two are ordinarily sufficient for irrigation, one on each side of the nullah. They may be made at different elevations of the bund, or on the same level, according to the ground and land to be irrigated. Should the whole of the land to be irrigated be on one side of the nullah, there may be two sluices, one at a higher and one at a lower level.

27. In some tanks the sluices are so constructed, that the whole of the water in the tank may be drained off; but it is desirable, I think, always to have some in the bed, as, if quite dry, the ground is very apt to crack suddenly, and the more so from having been wet. These cracks may extend under the bund, and lead to leaks, which are very difficult to stop, and often undermine the centre of the bund. Should the ground be rock, however, there could be no apprehension. Still, a little water is always of use, and might remain, if only to break the force of the first flood streams after the monsoon begins.

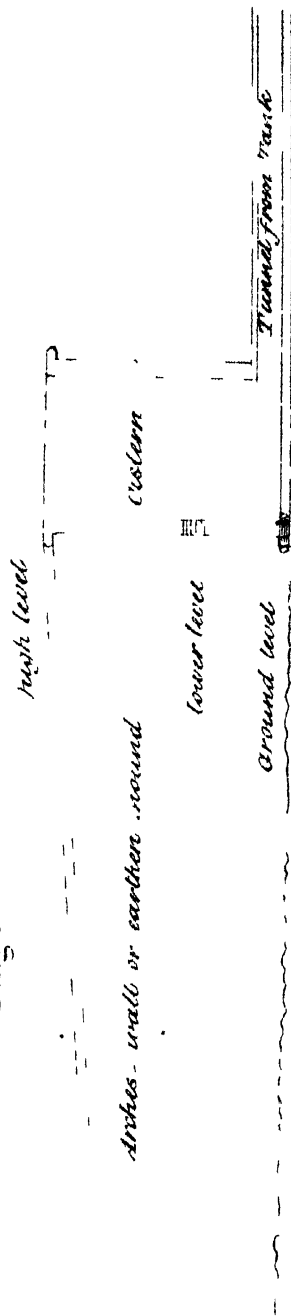
28. In constructing sluices, it is most necessary to see that the sides are very strong, and that there is no chance of lateral leaks, which would wash away the earth from the sides, and probably injure the bund, or even break it, as I have known to be the case. I would therefore advise, besides the masonry, that gravel and chunam concrete should be well beaten in behind the masonry, and between it and the earth. (See Diagram 8.) This plan will, I think, effectually prevent side leakage, and it might also be introduced where the front portion of the sluice, or chabootra as it is called, joins the bund.

29. In regard to taking off the water for irrigation, there are usually in large tanks two, or even three levels given in the sluice itself. All these can be opened in heavy floods to relieve the tank, and one at a time is used, according to the water level in the tank. The water, from whatever level used, falls into the channel (tunnel) under the bund, and then rises in the cistern behind to the same level, or something lower than the hole of the sluice used. From this cistern there are holes, which carry off the water to the channels, according to the height of water in the tank or cistern, either by earthen mounds, or, as I have seen, by channels made upon masonry walls, or upon arches, and carried to a neighbouring elevation, from whence it is directed into the general irrigation channel. (See Diagram 9.)

Diag 8.



Diag 9



30. There is nothing which at present occurs to me to require further explanation, and I therefore close these remarks. I may, however, state, in reference to the concluding part of paragraph 10, that I think it advisable on the whole that the face of the bund towards the tank should have a *less* inclination at first than 45° , because during the settlement of the earth and stone-work, the latter falls naturally against the earth, and the whole assumes gradually an angle of 45° , and it may be arranged on this principle. (See Diagram 10.) Or if the top be considered too broad, there may be a proportion taken off these, with a proportionate reduction of the base. It is, however, very desirable to have as wide a base as possible, and as easy a slope from the top as can be arranged in the highest part of the bund.

It is necessary, also, to remark that the earth-work should be 2 or 3 feet above the stone-work facing. This provides for the gradual subsidence of the earth, which should be watched carefully, and more earth added, as necessary, till the whole is perfectly level and firm.

(Signed) MEADOWS TAYLOR.

. *Camp at Jewurjee, April 2nd, 1852.*

SHORAPOOR SUMUSTHAN.

Estimate of proposed Tank at Jewurgee, Talooka Andola.

Portions of Bund.	MEASUREMENT.						Amount at 15 Cubic Yards per Rupee.			Grand Total.		
	Long.		Broad.		High.		Total.					
	Yds.	Yds. ft. in.	Yds. ft. in.	Yds. ft. in.	Cub. Yds. ft. in.	Rs.	a.	p.	Rs.	a.	p.	
No. 1	100	5 0 11 $\frac{1}{4}$	1 1 6		796 2 3	53	2	0				
2	100	6 0 7 $\frac{3}{4}$	2 1 8 $\frac{1}{4}$		1,592 2 0	106	3	0				
3	154	9 1 7	4 0 9		6,234 2 5 $\frac{1}{2}$	415	10	0				
4	208	17 1 10 $\frac{1}{2}$	8 0 9		30,244 1 6	2,016	5	0				
5	30	25 1 6	11 1 6		8,797 1 6	586	8	0				
6	10	25 1 6	11 1 6		2,932 1 6	195	8	0				
7	100	22 0 4 $\frac{1}{2}$	10 0 0		22,125 0 0	1,475	0	0				
8	100	17 0 4 $\frac{1}{2}$	7 2 1		13,176 2 2	878	7	0				
9	100	11 1 6	5 0 9		6,037 1 6	402	8	0				
10	200	7 2 3	3 0 9		5,037 1 6	355	13	6				
11	160	5 1 6	1 1 6		1,320 0 0	88	0	0				
Total.	1,262	....	....		98,295 1 4 $\frac{1}{2}$	6,553	0	6		6,553	0 6
STONE-WORK.						At 7 Cubic Yards per Rupee.						
No. 1	100	2 0 0	1 1 6		300 0 0	42	14	0				
2	100	2 0 0	3 1 6		700 0 0	100	0	0				
3	154	2 1 6	6 0 0		2,310 0 0	330	0	0				
4	208	3 0 0	10 0 0		6,240 0 0	891	7	0				
5	30	3 1 6	14 1 6		1,522 1 6	217	8	0				
6	10	3 1 6	14 1 6		507 1 6	72	8	0				
7	100	3 0 0	12 1 6		3,750 0 0	535	11	6				
8	100	2 1 6	9 0 0		2,250 0 0	321	7	0				
9	100	2 1 6	6 1 6		1,625 0 0	232	2	3				
10	200	2 0 0	4 0 0		1,600 0 0	228	9	3				
11	160	2 0 0	2 0 0		640 0 0	91	7	0				
Total.	1,262	....	....		21,445 0 0	3,063	10	0		3,063	10 0
Miscellaneous Charges.												
2	Sluices	..	..	..	..	800	0	0			
20	Candies of Lime	..	..	..	..	320	0	0			
2	Escapes	..	..	..	..	100	0	0			
	Native Writers, &c.	..	..	..	..	120	0	0			
	Overseer, Sepoys	..	..	..	..	120	0	0			
	Contingencies, Oil, &c.	..	..	..	..	100	0	0		1,560	0 0
Total.... Hyderabad Rupees									11,176 10 6			
Add amount for extra works, as per Supplementary Estimate.....									1,132 0 6			
Grand Total.... Hyderabad Rupees									12,308 11 0			

Camp Jewurgee, 10th May 1851.

M. TAYLOR.

*Supplementary Estimate of Additional Work recommended to the proposed
Tank at Jewurree.*

Portions of Bund.		EARTH-WORK.					STONE-WORK.				Grand Total
		Long.	Broad.	High.	Total.	Amount Cost.	Long.	Broad and High.	Total.	Amount Cost.	
No.		Yds.	Yds.	Yds.	Yds.	Rs. a. p.	Yds.	Yds.	Yds.	Rs. a. p.	Rs. a. p.
1		100	3	2	600		100	1	100		
2		100	3	2	600		100	1	100		
3		154	3	2	910		154	1	154		
4		208	5	2	2,080		208	1	208		
5		30	8	2	480		30	1	30		
6		10	8	2	160		10	1	10		
7		100	7	2	1,600		100	1	100		
8		100	6	2	1,200		100	1	100		
9		100	5	2	1,000		100	1	100		
10		200	4	2	1,600		200	1	200		
11		160	3	2	960		160	1	160		
		1,262	0	0	11,190	746 0 0	1,262	0	1,262	180 4 6	926 4
Extra work at East end.		100	3	3	900		100	3×1	300		
West end.		100	3	3	900		100	3×1	300		
		200	0	0	1,800	120 0 0	200	0	600	85 12 0	205 12
Total. . Hyderabad Rupees											1,132 0

M. TAYLOR.

Stone-work.

Portions of Bund.	Long.	At Base.	At Top.	Total.	Average at the rate of half.	Average of succeeding No. or Portion.	Total.	Net Average.	At beginning of each Portion.	At end of each Portion.	Total.	Average.	Stone-work, Total Cubic Yards.	Amount of Cost, at 8 Cubic Yards per Rupee.
Yds.	Yds.	Yds. ft. in.	Yds. ft. in.	Yds. ft. in.	Yds. ft. in.	Yds. ft. in.	Yds. ft. in.	Yds. ft. in.	Yds. ft. in.	Yds. ft. in.	Yds. ft. in.	Yds. ft. in.	Yds. ft. in.	Rs. a. p.
1	157	1 0 0	1 0 0	2	1 0 0	0 0 0	3 0 0	1 1 6	2 0 3	0 3 6	8 1 0	4 0 6	981 0 9	122 10 0
2	37	2 1 6	1 1 6	4	2 0 0	0 0 0	4 0 0	2 0 9	0 6 7	1 6 10	13 2	3 6 2	508 2 3	63 9 6
3	77	2 1 6	1 1 6	5	2 0 0	0 0 0	5 1 6	2 3 10	0 13 1	0 13 1	17 1	6 8 2	1,515 2 9	189 7 6
4	83	3 0 0	2 0 0	6	3 0 0	0 0 0	6 0 0	2 3 0	0 13 1	0 15 0	23 1	11 2 0	2,662 2 9	332 15 6
5	105	4 0 0	2 0 0	6	3 0 0	0 0 0	6 0 0	3 0 15	0 13 1	0 17 1	28 1	11 2 0	4,462 1 6	557 13 0
6	100	4 0 0	2 0 0	6	3 0 0	0 0 0	6 0 0	3 1 6	0 15 0	0 17 1	32 1	16 0 9	4,875 0 0	609 6 0
7	153	4 0 0	3 0 0	6	3 0 0	0 0 0	6 0 0	4 0 19	1 6 19	1 6 37	37 0	18 1 6	9,906 2 3	1,238 5 6
8	100	5 0 0	3 0 0	8	4 0 0	0 0 0	8 0 0	4 0 20	0 20 0	0 20 0	40 2	20 1 0	7,900 0 0	987 8 0
9	75	5 0 0	3 0 0	8	4 0 0	0 0 0	8 0 0	4 0 22	1 6 22	1 6 45	45 0	22 1 6	6,181 1 0	772 10 6
10	37	5 0 0	3 0 0	8	4 0 0	0 0 0	8 0 0	4 0 20	0 21 1	1 6 32	32 0	16 0 0	3,330 0 0	416 4 0
11	73	5 0 0	3 0 0	8	4 0 0	0 0 0	8 0 0	4 0 11	1 6 9	1 6 20	20 2	10 1 3	3,004 0 0	438 0 0
12	37	2 1 6	1 1 6	4	2 0 0	0 0 0	4 0 0	1 1 6	9 1 6	2 0 3	11 1	5 2 4	770 2 6	96 5 9
13	200	2 1 6	1 1 6	4	2 0 0	0 0 0	4 0 0	1 1 6	9 1 6	2 0 3	11 1	5 2 4	1,737 1 6	217 3 0
14	..	1 0 0	1 0 0	2	1 0 0	..	..	..	2 0 3	..	..	..	....	....
Foundation.														
	1,235	..	..	..	..	..	..	..	..	..	..	..	48,336 2 3	6,042 2 3
	1,050							2 1 6	..	..	..	0 2 0	1,750 0 0	209 6 0
Total	1,235	..	..	..	..	..	..	..	..	..	..	..	50,086 2 3	6,251 8 3

Memorandum of Costs.

							<i>Rs.</i>	<i>a.</i>	<i>p.</i>
Earth-work, including digging of foundation..	..	..	..	..	..	..	19,224	6	0
Stone-work, do. laying of do. ..	..	..	..	..	..	..	6,251	8	3
2 Sluices .. ..	..	..	..	..	..	..	900	0	0
2 Escapes .. ..	..	..	..	..	..	..	150	0	0
30 Candies of Lime .. ..	..	..	..	..	..	..	480	0	0
Native Writers .. ..	..	..	..	..	..	..	180	0	0
Overseer, Sepoys .. ..	..	..	..	..	..	..	180	0	0
Contingencies .. ..	..	..	..	..	..	..	200	0	0
Compensation for Itgi and Hundrahah Estimate	..	..	..	..	..	..	2,500	0	0
Total ....Hyderabad Rupees							30,065	14	3

M. TAYLOR,
On Special Duty.

Camp near Shahpoor, 11th June 1851.

The tank will not be quite so large as this estimate, as I wish to save Itgi and Hundrahah. The estimate made lately to complete the work, with what had been already done, was in all 19,000 and odd Rupees; but a further addition to the fund will be considered when what is in hand is finished.

MEMORANDUM BY CAPTAIN TAYLOR.

The intention of the peculiar form of the *apron* of this calingulah, as explained to me by Captain Buckle, is to diminish the force of the water as it escapes from the tank,—a precaution very necessary where the soil in which the calingulah is may happen to be soft. Thus the water running over at A is checked, and thrown up again at B, and runs level, or nearly so, over the pavement to C. The wall at C is to support the pavement, and the foundation should be carried down to strong ground. The upright stones allow of 2 feet water being retained in the tank by twisting branches between the stones, and backing them by clay or sods. Three feet, even, might be retained in this manner, when there would be still 3 feet to the top of the wing walls and bund. The pavement D D D should be of large rough stone. The rest may be of cut or squared stones, or concrete covered with fine chunam.

Jewurjee, 10th April 1852.

MEMORANDUM BY CAPTAIN TAYLOR ON SECTIONS OF THE
BUNDS OF THE NELLORE AND WOJELLY TANKS, FROM
CAPTAIN BUCKLE.

The Nellore tank is a very large one—I think about 6 square miles, but shallow. The bund is faced with stone. Here only 4 feet is left for safety, but the tank is closely watched, and on account of its shallowness does not throw up high waves.

The Wojelly tank is also a large one, and the Section is given to show a bund without stone. It will be seen that the base is in excess of the height. Such a bund could only be made of strong gravel and clay, or granitic soil, which binds strongly, and resists the action of water.

SELECTIONS FROM THE RECORDS OF THE BOMBAY
GOVERNMENT.

NO. VII.—NEW SERIES.

STATISTICAL REPORT
OF THE
COLLABA AGENCY.

BY

W. M. HEARN,
CLERK, AGENT'S OFFICE, ALIBAGH.

PUBLISHED BY AUTHORITY,
H. GREEN,
COMPILER & EDITOR OF THE SELECTIONS FROM THE RECORDS.

Bombay:

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1854.

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PREFATORY REMARKS.

IN submitting this Statistical Account of the Colaba Districts, it will be necessary for me to say something with regard to its compilation and general arrangement.

I have endeavoured as much as possible to reduce the work in size, by exhibiting as much of the information as I possibly could in tables and statements, and thereby avoiding lengthy details in writing; though I vain would hope that I have been sufficiently copious in my remarks and explanations wherever they were actually required to be so.

I have, as much as laid in my power, gathered all the information comprised in this work from the Government records, both Native and English; and wherever this failed, I was, through the kindness of the Agent, Mr. Jones, enabled to get new statements and tables drawn up by the Tulatees and Mamlutdars. The sources from which all the facts have been taken are mentioned in the notes, and I have only to add that the most rigid accuracy has been my chief aim throughout.

It is necessary for me to state that the compilation of the matter comprised in this work was not drawn up hastily—on the contrary, it occupied many months; though I regret that, having to leave Colaba rather abruptly, I had not time to give so much of my attention to some of the arrangements and writing as I had much wished to do; and if there are any imperfections, of which I doubt not there are many, I have only to urge this as my excuse. Should any part appear incorrect, or require explanation, I shall always be ready to devote my time and attention to the subject. The notes from which this was written will be preserved, so there will be no hinderance to my doing this.

With regard to the submission of Volume II., containing the Historical Account of Colaba, I would beg to remark, that it should have accompanied this, but on consideration of the urgency of the desires of the Honorable the Court of Directors for statistical papers, I have thought it advisable to

PREFATORY REMARKS.

transmit the first volume without waiting for the preparation of the second. I have collected a great number of interesting Mahratta manuscripts and documents with regard to the history and political changes of the country ; and I am now engaged in making an epitome of the whole, and also a short account of the various exploits of the Mahomedans, the Portuguese, and the Hindoos, and their piratical chiefs the Angrias.

I am indebted for Part IV., regarding " Atmosphere and Climate" and " Health and Disease," to the Apothecary in Medical charge at Alibagh.

In order to avoid delay in the transmission, I have prepared triplicates of this work, and the time occupied in the copying has in no small degree retarded its submission.

In conclusion, I beg to offer my sincere and grateful thanks to Mr. Jones, the Agent at this place, for his valuable aid in the preparation of this my first attempt.

I must express the great assistance I received from Khunderow Bapoojee Goopty, a Karkoon in the Hoozoor Duftur Office, in the collection of the matter for most of the statistical tables ; and I must state, that through his intelligence, attention, and excellent knowledge of revenue business, I was saved a great amount of labour.

W. M. HEARN,
Clerk, Agent's Office.

Alibagh, 26th March 1851.

STATISTICAL REPORT OF THE COLABA AGENCY.

PART I.

GENERAL DESCRIPTION.

Description of Boundaries.—The district forming the Colaba Agency is that piece of territory lying between $72^{\circ} 55'$ and $73^{\circ} 10'$ W. longitude, and $18^{\circ} 30'$ and $18^{\circ} 51'$ N. latitude; and consists, in the words of Act No. XVII. of 1844, of that portion of the lapsed territory “ which is bounded on the east by the Nagotna river and the talookas of Sankse and Rajpoore, on the south by the Rewdunda river, on the west by the Sea, including the islands of Colaba, Oonderee, and Khanderee,* [Henry and Kenry,] and on the north by the Harbour of Bombay.” The boundaries are well defined by nature: the one on the western side runs in a waving line for $18\frac{1}{2}$ miles along the sea-shore as far as the north-western end of the fort of Rewdunda, where it turns off, and running along the northern side of the ditch, (leaving out the fortification, which is in the Tanna zillah,) it takes its course along the Rewdunda or Rohi Ushtumee creek for 10 miles, where it meets the southern boundary. The islands of Henry, Kenry, and Colaba are included. The southern boundary takes its course for 7 miles along the banks of the same creek (Rewdunda), and terminates at the point beyond the village of Cheora. The eastern boundary thence runs along the sides of the hills quite close under Sambree Khind for 10 miles, a very little beyond which it meets the Nagotna creek, along the banks of which it runs for $17\frac{3}{4}$ miles, and terminates at the extreme point of Colaba. The northern boundary takes its course for 6 miles along the sea facing the Bombay harbour, and ends at the western point.

Area.—I have ascertained the area of the district by making an accurate

* This island is just now neutral ground: the Collector of Tanna seems to consider that it is still in his jurisdiction. (See letter dated 13th May 1846, No. 355.) The establishment of peons kept upon the island belongs to Tanna.

enlargement of Captain T. Jervis' map, and carefully measuring according to a scale of one* inch to a mile.† The result is as follows :—

	Square Miles.	
Talooka Oonderee	109	and a fraction.
Talooka Rewdunda.....	102	ditto.

Total of the Colaba Agency 211½

The accompanying is a map of the district, with all the villages, &c. marked thereon.

Natural Aspect.—Nothing is so varied as the aspect of the country in the Konkun. Here in this small district we have an endless variety. From the sea the eye wanders over a narrow belt of garden land lying along the beach, here and there broken by a few small creeks, behind which a range of hills is seen stretching from north to south, and extending as far as the eye can reach. To the eastward of this, again, are seen other hills in the Tanna district, and behind them the stupendous Ghauts towering up into the clouds, and forming a dark outline to the view. From the east, sailing up the Nagotna creek, the extensive flats are seen with the Colaba hills starting up behind them, and the little winding rivulets running down towards the flats, where they meet with the minor salt-water inlets, and become absorbed in the large Nagotna creek. The hills viewed from the east present a very picturesque and bold appearance. This is, perhaps, more apparent than real, and may be owing to the great contrast afforded by the low even flats, and the jungle being thicker on the slopes of the hills on the eastern side. On the south, the country presents a still more bold and wild appearance : the hills running from north to south and east to west are varied and irregular in their forms, and are covered with a dense jungle. A small patch of cultivated land is only here and there to be seen peeping through the mass of vegetation. From the north, the eye stretches across the cove of Mandwa, where the hills gently terminate, shelving down in the direction of the sea ; the mouth of the Nagotna estuary is seen stretching out in the distance towards Caranjah and the south-east of Colaba, and, taking a gradual bend a little higher up, is lost to the view.

To obtain a complete view of the whole, the hill fort of Sagurghur, which is situated about the centre of the district, and 1,164 feet above the level of the sea,‡ must be ascended, and the scenery from this place on a fine day is perhaps as beautiful as can be imagined : the verdant hills stretching out north and south, some of them clothed from top to bottom with the most luxuriant foliage, others with their rugged slopes and the deep peaceful valleys at their bases covered with thick jungle, present a fine specimen of mountain scenery in the Konkun. Then, looking towards the sea, it is seen forming the

* For convenience of publication this map has been lithographed on a scale of two miles to an inch.—*Ed. Govt. Records.*

† See Agent's letter to Government of 20th November 1848, No. 690, and to Revenue Commissioner's of 5th December 1849, No. 767, regarding this map.

‡ Ascertained by a barometrical observation.

boundary on the north and west, studded by the two pretty island forts of Henry and Kenry, with the hill of Caranjah visible to the north, and the island of Bombay forming a line in the distant horizon; and on turning round towards the east, one sees the well-cultivated country with its many little villages lying between the foot of the hills and the winding creek of Nagotna.

Geological Structure.—The whole is of the trap formation: in the plains it is found in tabular masses a few feet below the soil, and sometimes projecting through the surface; in the hills it presents the tabular appearance, and is also found in irregular masses and shapeless boulders, the latter varying from a few inches to several feet in diameter. In many places the surface of the trap presents a rusty iron colour, indicating the presence of ferruginous matter.

Soils.—The soils may be divided as follows:—*1st*, diluvial and alluvial, composed of various disintegrated rocks of the overlying trap formation, with a large or small proportion of calcareous substances;* *2nd*, soils formed by the disintegration of laterite and trap; *3rd*, clayey mould, resting upon trap; *4th*, soil containing marine deposits, a large portion of sand, and other matter in concretion.

Of all these the first is by far the richest, and occupies the greater portion of the district: its productiveness is ascribed chiefly to the presence of lime, which is found in nodules called kunkur. It also contains a good deal of vegetable matter in the centre of the valleys, and near the banks of the large rivulets. This soil occupies the whole of the space between the foot of the hills and the garden plantations on one side, and the salt batty lands on the other. Running from Alibagh in a northerly direction, for about 8 miles, is a slip of this soil, varying from a quarter of a mile to about a mile in breadth, which contains an excess of lime, found quite near the surface; and owing to this cause it remains uncultivated: with a little mixture of the adjoining red soil it might be made highly productive.† The next in point of extent is the second description of soil: it covers the sides and slopes of the hills and elevated mounds. It is formed by the roots of trees and shrubs detaching and pulverizing the rock; and by this process in course of time it becomes fit for the cultivation of the hill crops, such as naglee, wurree, hemp, &c.; but owing to the little depth of the soil it soon becomes exhausted, and is therefore allowed to lie fallow for a few years, to permit of the re-collection of the detritus.

The third description of soil is mostly to be found on the eastern part of Colaba, where there is a piece running along by the side of the Nagotna creek, about 18 miles in length, and varying from half a mile to three miles in breadth. There are also other detached pieces of this description of soil to be found near the Rohi Ushtumee creek, on the southern and western sides of Colaba. The soil is called by the Natives kharapat, meaning salt land. It was originally submerged by salt water, and there are documents extant‡ showing that it has only been recovered from the sea within the last three hundred years.

* See Major T. B. Jervis' Statistics of the Western Coast of India.

† Sometimes this is resorted to by the Natives.

‡ In the possession of Abajec Krushna, Koolkurnee of Thul.

The mould is mostly of a very dark brown colour; the best description is black. Near the vicinity of the Nagotna creek it is here and there interspersed with little calcareous tubes, varying from one to eight inches in length: they are called by the Natives ludhú (लुडु), the literal translation of which is "scum of the sea."

The fourth description of soil lies immediately upon the sea coast, running from the extreme north point of Colaba, and terminating a little below the entrance of the Rewdunda creek. It is about 18 miles in length, and varying from about a quarter of a mile to a mile in breadth. The concretion serves as a substratum for better soil: the drifted sand forms a light covering at first, which the *elymus arenarius* and a hardy description of grass soon bind together; the process going on, various kinds of *scilla* (squills), the *pandanus* (or ketkee), and other plants carry on the work, till at length there is sufficient for the cocoanut to take hold by.* Such are the sites of the Colaba cocoanut plantations, won in the course of years from the ocean. The late Agent, J. M. Davies, Esq., in speaking of this belt of soil, says in his excellent report†:—"The plantations are naturally favoured, being sustained, as they doubtless were originally suggested, by the abundant supply of water contained in a slip of concrete of sand and lime * * * * which bounds the coast, and absorbing the sea water, yields it again sufficiently filtered for purposes of cultivation. Lying upon this crust is a considerable depth of fine vegetable mould, which from experiment I have found to yield European and Native vegetables in great abundance."

PART II.

AGRICULTURE, PRODUCE, AND REVENUE.

Productions.—Annexed is a list giving in detail the Native and scientific names of all the products cultivated in the district. The first two divisions in the statement are "Jeerayut" and "Bagayut." The former may be said to occupy a little more than seven-eighths of the cultivated land, and the bagayut the rest. The reason of the Native divisions being adopted in the headings of the columns, in preference to making new ones, is owing to the cultivation being so exhibited in the Government records, and consequently making the information more easily attainable; but at the same time, it must be understood that the arrangements could not have been much improved by any alterations.

* See Major T. B. Jervis' Statistics of the Western Coast of India.

† Revenue Department, dated 27th July 1846, No. 201.

Khureef, wurkus, and tag are cultivated immediately after the 5th June ; the cultivation of rubbee and malwai commences about the end of the monsoon. Bagayut or irrigated lands are cultivated nearly throughout the whole year. It will be seen from the statement that rice, under the head of khureef, is the staple produce of the district ; bagayut comes next ; then wurkus, and so on to rubbee, tag, and malwai. The names of each produce under the respective sub-divisions are also arranged in the order of the extent of cultivation : for example, under the head of khureef, in the oothlapat, punwail comes first, thus showing that more punwail rice is cultivated than any other description ; pandre hulwe comes next, and so on.

Modes of Cultivation.—As the rice is the staple produce of the district, its mode of cultivation is given in full detail. Between December and May the patch of land that is selected out of each field to provide plants for the whole is first of all carefully covered with cow-dung, and sometimes with bushes. This is overlaid with thick grass, and over this, again, fine grass is spread, to take off the inequalities, and to fill up interstices to receive the earth which is spread over the top. This is then set fire to on the leeward side, and generally towards morning, which is the best time, after the falling of the heavy dew.

In June, after the land has been sprinkled by a few showers, it is strewn with rice, and then ploughed, or rather scarified ; the latter process has the effect of either turning the earth over the rice, or driving the latter into the soil. The plough, which is a very primitive concern, is worked either by a pair of buffaloes or bullocks, and a man to direct, who also drives : the former are guided by the driver's stick only, no nose-string being used, as is usual in the Deccan. The plants shoot up after a few heavy falls of rain : they are then allowed to grow for three weeks or a month ; and at the end of the constellation Arudhra, to the end of Poonurwusoo,* after the soil has become quite soft, they are pulled up in little bunches, and planted at distances of from eight to ten inches from each other in the other soil, which is previously ploughed, and sometimes cleared of grass by the ala or rake. The process of planting and transplanting being thus completed, the land is afterwards only weeded from time to time. The reaping is performed between the months of October and November by the veela or reaping-hook. The crop is left in the field, where it is spread out to dry more perfectly ; it is afterwards tied up in sheaves, and built into a stack. After a month or so, the threshing commences : a small piece of hard ground (sometimes a rock) is selected, which is well cleaned and swept ; the sheaves are then beaten against the ground. This is continued until the whole of the grain has been separated from the straw : the latter is then put by for the cattle, and thatching purposes. The winnowing now follows, which is done by filling a flat basket (scoop) with the grain, and slowly emptying it upon the ground from as high as the upraised arms can hold it.

* For explanation regarding the constellations, see page 9.

In the salt rice land no plough is used, neither is the soil manured. After the beginning of June, when the ground has become thoroughly saturated, and quite soft, the seed is either thrown into the mud, or, where the land is low, and subject to overflowings of rain water, it is wetted and placed in a heap until it sprouts, when it is thrown into the mud. No transplanting takes place; but after the plants have grown up a little, those that are crowded are pulled up, and placed at greater distances from each other. The chief thing to be observed in the salt batty land is the embankments, which require great labour and expense in keeping in repair. Should a field by any accident be flooded by salt water, the crops for three years would be of a very inferior description. The reaping and threshing is exactly like that in the sweet rice land.

Wurkus cultivation is divided as follows:—1st, land on the slopes of the hills, and 2nd, elevated land, near the rice fields, and table-land on hills. In the first description of cultivation the soil is first cleared of brushwood, &c. which is afterwards, between March and the end of May, spread out and burnt as manure, and any inequalities in the land are taken off with the pick-axe and hoe (powrah); and on the commencement of the monsoon, after the soil has become thoroughly wet, the seed (only naglee and wurree) is thrown into the mud; and no further operations are required beyond keeping up a vigilant watch a little before harvest, to prevent wild animals destroying the fields. After the crops have ripened, the ears are plucked off and thrown into blankets; the seed is then worked out with the feet. The process in the second description of cultivation is as follows:—The land that is selected for the rearing of the naglee and wurree plants is in the first instance covered with cow-dung and grass, which is burnt in the cold weather; and after the beginning of June, the soil is strewn with the seed, and then ploughed. The mode of transplanting, &c. is like that in the sweet rice land, and the threshing like the foregoing. The other productions from Nos. 3 to 7, such as teel, oodeed, &c. are cultivated without the burning process, but the land is first ploughed and then sown.

The rubbee land is re-ploughed after the removal of the first rice crops; the seed is then thrown in, and occasionally, where the soil is deficient in moisture, and wal is required to be grown, the drilling process is adopted. Nearly all rubbee fields are enclosed by hedges.

The mode of cultivating tag or hemp is similar to that of the other kinds of grain grown on the wurkus or hilly lands. After the reaping and threshing take place the stalks are thrown into water, and there allowed to decompose. The fibres are then separated, and made into twine or ropes: the pith is reserved for the purpose of making the common matches. It is to be remarked that besides the ryots, the Kooles or fishermen generally cultivate this plant.

Malwai or vegetable cultivation is like rubbee, with the exception that the former is irrigated.

The cultivation of the two principal products in the bagayut or garden land, viz. cocoanut and betelnut, is as follows:—After the nuts have become quite

ripe, which is ascertained when they fall of themselves to the ground, they are buried about two feet in the soil, which is previously loosened and levelled; and after the plants are a year old they are transplanted, and buried about two feet deep. The soil is then enriched by mixing up with it salt and naglee (*cynosurus corocanus*). The chief thing afterwards is the watering, and great expense is obliged to be gone to in making wells and watercourses and wheels. After the eighth, ninth, or tenth year, the trees commence to bear, yielding twice a year, and sometimes thrice: 120 cocoanuts and 250 sooparces is about the annual average produce of each tree. A great many of the cocoanut trees are also tapped: the toddy is extracted by cutting off the tops of the young shoots when they are little more than two feet long, and tying them very tight at intervals of a few inches.* The Native name of the instrument used for cutting the shoot is awt. It is as sharp as a razor, and is described under the head of implements. The juice of the tree drops into an earthen vessel which hangs on the top of the shoot, and is emptied every morning and evening into a calabash, which the Bhundaree carries up the tree by hanging it behind him on a hook. A seer and a half is about the average daily quantity extracted from each tree. The toddy is mostly made into liquor; a little of it is sold in the raw state.

The pan or piper betel leaf, which is a perennial, is cultivated extensively throughout the plantations, but particularly in the southern parts, towards Cheol, Rewdunda, and Nagaon. The soil is first well ploughed and dug; ridges are made, and the cuttings are planted in them: reeds of the wattle (karwee) are then stuck into the earth, for the creepers to cling to. They are shaded by cadjans until they take root, and are manured occasionally with decomposed fish. If the watering is properly attended to, the creeper yields after the first year. The leaves are exported largely to Bombay during the rains.

The kailee or plaintain yields only one crop, when it is cut down; but new shoots spring up around the roots, which are transplanted, and placed in rows at intervals of four or five feet, and bear fruit in the second year.

The tad or palmyra is not much attended to: it is seldom or never watered. A very sweet toddy is extracted from it, which is mostly made into liquor.

The oondee and kurrunj (*calophyllum inophyllum* and *pongamia glabra*) are only watered while very young. They are very hardy trees, and bear nuts once a year, from which a bitter description of oil is extracted, which is used largely by the Natives for burning purposes. It is expressed in the common mill by the Beni Israelites, who are the only Teelies or oilmen in the district. The kernels are well dried, and that of the oondee is cut in pieces before being thrown into the mill.

The chinch or tamarind tree grows without care, and yields once a year. The tamarind is shaken off the tree, and after a little drying the rind is taken off, and sometimes the seed is extracted, which is bought up by the Dhungurs

* A tapped tree, while the juice is extracted from it, yields no cocoanuts.

or cumlee manufacturers, who pound it, and use it as a sort of starch for the blankets. A small quantity of tamarind is exported every year to Bombay.

The ambai or mango tree grows spontaneously throughout the whole of the plantations, and being a hardy tree, it is to be found growing in very inferior soil in the interior; but the best description of mangoes are only to be had in the bagayut, where also (in Alibagh, Cheol, and Rewdunda) a few descriptions of the graft of a very superior kind are procurable. Those grown in the Dewan's and Ranee's gardens in Alibagh, are of the very best description. The common mangoes are exported largely in a green state to Bombay.

Phunus or the jack tree is only watered for the first few years. It afterwards grows without trouble, and yields once a year. A good deal of this fruit is sent to Bombay.

Annanus or pine-apples vegetate mostly in Cheol and Rewdunda, and are not much cared for; but those that are looked after and well watered attain a large size, and are very luscious. They are sold for about three or four pice apiece, and are mostly bought up for exportation to Bombay, where they fetch from four to six, and even eight annas each.

The other bagayut products not bearing any proportion to those already written upon, it does not appear necessary to enter into the details of the modes of their cultivation; besides, the process does not differ so materially as to require separate notice. Describing them in lump, it is sufficient to say that the vegetables are, generally speaking, obliged to be watered and looked after, and the fruit trees are left to grow without any such assistance.

Lunar Asterisms, or Nukshutras.—The ryots, in going on with their operations of tilling, sowing, and reaping, &c. are guided by certain divisions made in the year, called nukshutras. There are twenty-seven of these, and the average duration of each is about thirteen days and a half: the dates and periods, &c. of these lunar asterisms, are given in detail in the subjoined table. The translation of the Sanscrit names was made into Prakrit by a Shastree of Alibagh, from which it has been rendered into English. The information regarding the number of stars forming each constellation was also supplied by him.* Notice has been taken of these nukshutras, because the cultivators arrange their operations solely according to the description of fall of rain to be expected, which is pretty well ascertained by referring to these divisions, which are mostly regulated according to the changes in the phases of the moon.

* On referring to Vol. IV. of Sir William Jones' work, in which this subject is treated of at great length, I find that the information afforded by the Shastree is correct.

Names of the Nukshutras or Lunar Asterisms.

Seasons.	No. of Stars forming each Constellation.	Names of the Rains or Lunar Asterisms.	The Symbols of the Asterisms.	Dates on which the Rains or Lunar Asterisms commence.	Duration.	Remarks.
Sowing season.... Transplanting commences about the end of.. ..	3	Ushweenee ..	Horse's head.	11th April.	14 days.	Lightning & rain.
	3	Bhurnee	Pudendum muliebre ..	25th " "	14 " "	
	6	Kruteeka ...	Razor..	9th May.	15 " "	
	5	Roheenee ...	Cart	23rd " "	13 " "	
	3	Mrug	Deer's head..	5th June.	15 " "	
Transplanting season	1	Ardra	Bead	20th " "	14 " "	Very heavy rain.
	4	Poonurwusoo.	House	4th July.	14 " "	
	3	Poosh	Arrow	18th " "	14 " "	
Weeding season ..	5	Ashleshu....	Circle	1st Aug.	14 " "	Passing showers.
	5	Mughe	Mansion	15th " "	13 " "	
	2	Poorwa ...	Bedstead	28th " "	11 " "	
Reaping commences	2	Ootura	Cot	11th Sept.	14 " "	Passing showers.
	5	Husth	Hand	25th " "	13 " "	
Reaping season..	1	Chitra	Pearl	8th Oct.	14 " "	Do., accompanied by thunder and lightning. Winding up of the monsoon.
	1	Swatee.	Coral	22nd " "	13 " "	
	4	Veeshakha ..	Garland ...	4th Nov.	13 " "	
	4	Unooradha ..	An oblation to the Gods..	17th " "	13 " "	
	3	Jeshtha	Ear-ring ...	30th " "	13 " "	
	11	Mool	Lion's tail ..	13th Dec.	14 " "	
	2	Poorwashadha	Elephant's tusk	27th " "	13 " "	
	2	Ooturashadha	Bedstead	9th Jan.	13 " "	
	3*	Abhijeet.				
	3	Shruwancee ..	Three foot-steps	22nd Jan.	13 days.	
	4	Dhneeshta..	Drum	4th Feb.	13 " "	
	100	Shututarka ..	Circle	17th " "	13 " "	
	2	Poorwabhad-rupada....	Cot	2nd Mar.	14 " "	
	2	Ooturabhad-rupada....	Couple	16th " "	12 " "	
	32	Rewutee	Labour	28th " "	13 " "	
					365 days.	

* Abhijeet is only inserted in the Jotishi table for some astrological purpose in nuptial ceremonies.

Implements of Husbandry.—An attempt has been made in the drawings annexed to give an idea of the instruments used in the agriculture of this district. Nos. 1 to 7 are the implements employed in the jeerayut, and Nos. 8 and 9 those used in the bagayut or irrigated land. The chief instruments in the jeerayut are the nager or plough (No. 1), the ala or rake (No. 2), the peitara, a description of shovel used to scrape off the surface of the land (No. 3), the koodlee or large pick-axe (No. 4), the painsun, a small description of shovel (No. 5), the veela or reaping-hook (No. 6), and the soop or winnowing basket (No. 7).

No. 1.—The nager is a small description of plough, made up in a rude manner. The only piece of iron about it is the phal, which serves the purposes of a coulter. This instrument is used for turning up the land, which it does in a very imperfect manner. It is mostly employed in the sweet rice land, to work up and loosen the mud after the first few falls of rain. It is worked either by a pair of bullocks or buffaloes, and one man, who also drives. The dimensions of each instrument are given under its own respective drawing, so it is not necessary for me to say anything upon that head.

No. 2.—The ala serves the purposes of a rake: it is of a very rude make, and is worked like the plough. It is used for loosening the mud, and clearing it of grass.

No. 3.—The peitara is a sort of shovel, to the upper part of which is attached a frame of slit bamboos, tied closely together to three iron uprights: the interstices are filled up with cow-dung. This frame is a little depressed in the centre: the iron plate *c d*, which is pressed down at the handle *a* by the driver, scrapes up the surface of the soil, and whenever it is necessary to throw off the earth the driver turns the frame over towards the bullocks. This implement is both used for deepening rice beds and levelling land.

No. 4.—The koodlee is a sort of pick-axe, and is used chiefly in the rice land.

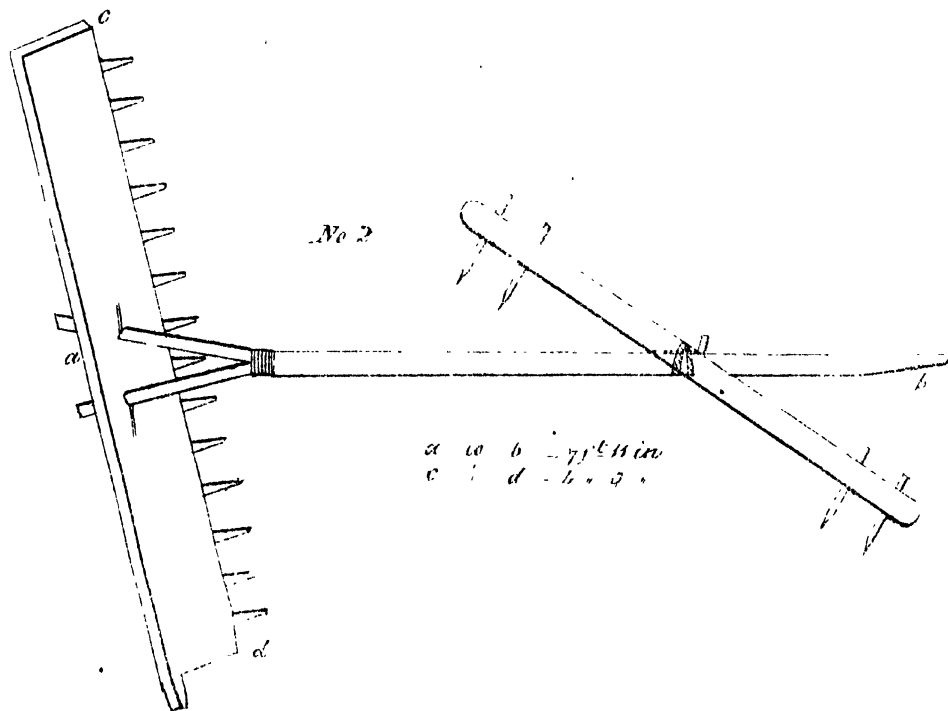
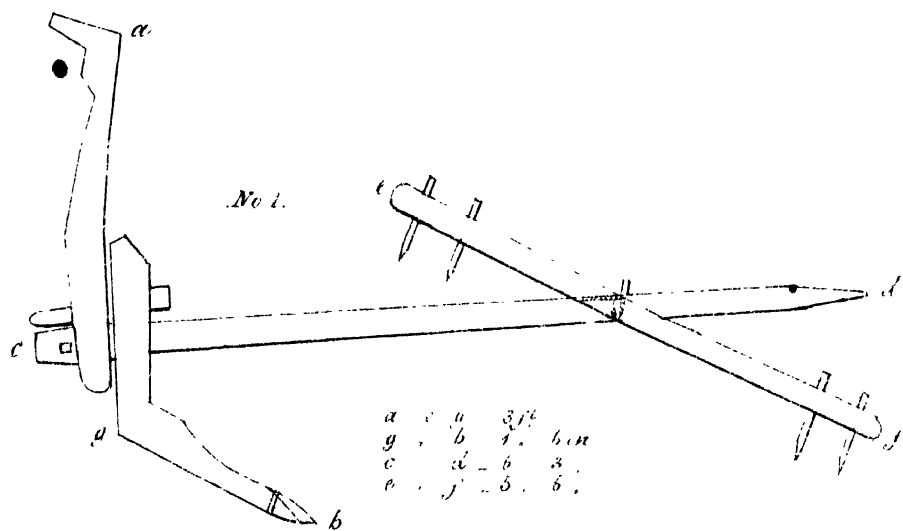
No. 5.—The painsun is a small description of shovel, used for turning up the turf: in the sweet rice land it generally has a piece of iron attached to the end of it, as in the drawing at *a b*; but in the salt rice land it merely consists of a hard piece of wood flattened at the extremity.

No. 6.—The veela or reaping-hook is a small instrument; edged like a saw.

No. 7.—The soop or winnowing basket is used throughout the whole district: it is made of bamboo wicker-work, and plastered over with cow-dung. The manner in which it is used in winnowing has already been explained in page 5.

The rhat or water-wheel, and the awt or Bhundaree's toddy-knife, are the principal implements used in the bagayut or irrigated lands.

No. 8.—The rhat is, I believe, like the Persian water-wheel, but instead of a camel, it is worked either by a bullock or buffalo. The manner in which the wheel is made to revolve will be seen from the drawing. The earthen



pitchers, which are tied in a wreath, turn round upon the large wheel, and bring up the water. The bullock, being hoodwinked, so as to allow the gardener to leave him to look after the trees, and alter the course of the water, keeps working round, unconscious of the absence of the driver. The average cost of a water-wheel without the bullock is Rs. 85.

No. 9.—The awt, or Bhundaree's toddy-knife, is shaped like a reaping-hook, only that the blade is very broad, and made chiefly of steel: it is always kept exceedingly sharp. The uses to which it is applied are given in page 7.

Labour employed, and its Remuneration.—Manual labour is the most extensively employed, but bullocks and buffaloes are also used to a great extent for the plough and rake, the turning of water-wheels, and the dragging of carts. To describe the descriptions of labour brought into operation for the purposes of agriculture, it is necessary to divide them under two heads, viz. jeerayut, mostly rice land,* and bagayut, or irrigated land:—

Jeerayut.—In jeerayut land, manual labour is chiefly used during the manuring season. The hire paid to a man for a day's work averages from 1 anna and 10 pies to 2 annas, and 1 anna and 5 pies for a woman. The hire for a plough, with pair of bullocks and driver, comes to 6 annas a day; and if bullocks and driver are required without the plough, they are generally taken for the whole season: the hire to the driver comes to 2 annas per diem, and the person hiring the cattle, besides feeding them, gives the owner at the end of the season, if for a pair of bullocks, 6 maunds of batty (rice in the husk), and for a pair of buffaloes 8 maunds. From the transplanting to the harvest season manual labour is solely employed, and the average amount paid to a man is from 1 anna and 10 pies to 2 annas and 6 pies, and to a woman from 1 anna and 6 pies to 2 annas. During the threshing season, the amount of hire increases considerably: a man gets 3 annas a day, or 4 pylies of batty. Amongst the poorer cultivators, they seldom hire people to work for certain fixed rates, but assist each other in the agriculture of their fields. Carts work for about seven months throughout the year, and the average amount of hire paid is 6 annas per day; this includes the bullocks and driver. Carts are used chiefly for transporting grain from the threshing-floors to the several villages, markets, and bunders. A great deal of grain is, however, taken from place to place by Kolée women, who make very good porters: they derive a good profit from this description of work, owing to the total want of roads throughout the district.

Bagayut.—In bagayut land, when the plough is required for turning up and levelling the soil, 6 annas are paid per day, with bullocks and driver. Labourers get 2 annas each per diem. Carts employed in bringing thorny bushes for hedges* get Rs. 1 per day; this includes the labour for cutting down the bushes in the jungle. Hire paid for a bullock to turn water-wheels is 2 annas and 6 pies

* Throughout the bagayut nearly every plantation is enclosed by a hedge.

per day. Malces or gardeners get about Rs. 4 per mensem; but it is not unfrequently the case that these men, as well as mostly all private servants, get advances of money from their masters, for which not only in many instances is exorbitant interest charged, but the borrowers are bound down to work for a certain number of years; and in the interim, if by any unexpected means the servant is able to clear the debt with interest, yet, from the nature of the bond of agreement, he cannot quit service until he has fulfilled to the uttermost the terms entered into by him.

A great portion of the bagayut is irrigated by contract: a man undertakes to water a garden for a small sum, under the condition that he be allowed to grow vegetables, &c. in the vacant parts.

Manual labour is, however, considered to be very remunerative in Colaba, and this is corroborated by the fact of numbers of Hetkurees having come from the Southern Konkun, and settled down here as labourers.

Prices of Principal Products.—The annexed is a table of the prices from the year 1817-18 of all the principal products grown in this district: the information has been collected from the account books of some of the principal landholders in the district, and from the old records of the late State; and I think its accuracy may be relied upon.

One great pity, however, is, that in the rates previous to 1836-37, I have not been able to ascertain the description of money paid, whether in Ankosee, Alibaghee, or Company's rupees, owing to the accounts from which the rates were extracted not containing this information; but I think that as the Alibaghee was most current at the time in this district, that most of the money transactions must have been in that rupee, which is equal to about 14 annas and 8 pies of Company's currency; but the Natives and landholders say, that although they have now come to learn the difference in the exchange, yet formerly an Alibaghee rupee was considered equal to a Company's, and it often passed as such. We may therefore take the above rates as they stand, without making any allowance for the difference in the exchange, for the purpose of comparison.

Let us now commence to review the table, which contains a good deal of useful and interesting matter. It will be observed, that I have not succeeded in getting the rates of the inferior sort of rice for the first eleven years, although I tried in several places; and I have not been able to ascertain the actual cause of this omission in the accounts examined by me, although I frequently inquired about it. One reason was, however, mentioned, that it was owing to most of the coarse grain being consumed in the district, and therefore there were very few monetary transactions with regard to its transfer from one hand to another, and that mostly the whole of the superior sort of rice being exported, a correct account was always kept of its quantity and price.

The prices of all descriptions of grain were highest in 1824-25, being about 81 per cent. above the average rates: this was owing to the very small

quantity of rain which fell during that year;* and yet it is remarkable that cocoanuts and plantains were about Rs. 13-8-0 per cent. under the average: this may be accounted for in the following manner, viz. that the consumption of cocoanuts and fruit is always great during the marriage season (and even now I have known it to have had a visible effect on the market rates), so during a year of famine it is not likely that anything near the usual number of marriages took place. And yet, again, the dearness of grain should have had the effect of increasing the prices of the fruits, which are used in a variety of forms as food; but then, on a comparison of the rates of another year, this is not borne out, and only tends to confirm what has already been given as a cause of this apparent inconsistency: for instance, in 1841-42, when rice was more than 34 per cent. below par, and cheaper than in any other year, the price of cocoanuts rose $7\frac{1}{2}$ annas per cent., and plantains Rs. 6-6-6 per cent. above the average rates.

It will be seen that rice is always cheapest about December, and dearest in June, *i. e.* about the commencement of the rains; like nachnee, which is also cheapest after the gathering in of the new crops.

Tenure and Occupation.—The system of tenure under the former Government was purely ryotwar, that is, the settlement of the revenue was made with each individual cultivator, without the interference of a middle party; and no alteration has been made in this system since the introduction of the British rule. With regard to the occupancy of the land, it may be said that the ryot holds permanent possession, and is not liable to ejectment under any circumstances so long as he pays the Government demands, and there is no defect in his title to the land; he can also by sale or otherwise transfer his right to another. There is, however, a little land here and there, called *khaireej mukta jumeen*, or *eksallee mukta jumeen*,† which Government has the power of letting out annually to any person who may agree to give the highest amount of land-rent on the same. In *wurkus jumeen*, that is hilly land, which can only be cultivated for two or three years running at a time, the occupancy of the cultivator only exists so long as he cultivates it, which from the nature of the soil he cannot do beyond a year or two, or three at the utmost, and as a matter of course is obliged to throw it up, and consequently can afterwards have no better right to it than any other individual. There are nine and a half *inam* villages in the Agency, yielding at an average Rs. 5,668-11-0 per annum, but in these, also, the land is under ryotwaree tenure, and the only difference is that the rent, instead of being collected by Government, is taken from the cultivators direct by the *Inamdars*.

The late Agent, J. M. Davies, Esq., in speaking of the system of tenure under the late Government, says in his *Jumabundee Report* for 1844-45, dated 20th November 1845, No. 260, paragraph 16:—“Upon a former

* The fall of rain registered in Bombay, about 20 miles distant, was 33 inches 97 cents.

† This is called *chicklee jumeen* in the Tanna Collectorate.

occasion I had the honour of remarking that the system adopted under the late Government of Colaba, was entirely ryotwar, without the interposition of the leasing system, and least of all of the khote system, so well known in the neighbouring talookas of Rajpooree and Ryghur. Opposed as this may at first appear to the favourite method of revenue management obtaining in most Native States, its non-introduction is easily accounted for in so small and compact a district as Colaba, where the manager's eye pervaded throughout, and where a distribution of profits would only have tended to lessen his own. But the recurrence of frequent surveys (sunchnees) under the late Government, with the avowed object of increasing to the utmost limit the demands of the State upon the products of the soil, was naturally and very justly regarded by the people as an oppression, tending to check permanent improvement, and to disturb the occupancy of the land. The ryots of those villages which from time to time have, by exchanges of territory, become transferred to Angria, have in particular recorded, in earnest remonstrances to the British Government, their sense of the oppressive revenue system of their new masters."

Modes and Rates of Assessment.—The modes of fixing the annual revenue, both land and sayer, are as follows, and are divided under the following heads :—

Land revenue is divided into jeerayut and bagayut. Under the head of jeerayut, the principal item is that from khureef land, which is, again, subdivided into oothlapat, or sweet rice land, and kharapat, or salt batty land. The other items under khureef are wurkus, rubbee, tag, and malwai.*

The system of assessment in the oothlapat is as follows :—

The rates (aeendust) or regular land tax vary from $1\frac{1}{2}$ to $10\frac{1}{2}$ maunds per pucka beega or acre, which at a rough estimate produces at an average from $1\frac{1}{2}$ to $2\frac{1}{2}$ khundies (of 20 maunds per khundie), and when the other petty cesses (*i. e.* suwae wurtala, babtee, and mooshira, &c.) have been added on to this, it is termed oosnai. This includes every description of tax and cess upon the land, and averages at about 15 maunds per pucka beega or acre; and taking the average of the produce at 40 maunds (which is considered fair) this would give three-eighths of the whole as the Government share, which is above the standard laid down in the Hindoo law, viz. one-third of the produce. The petty cesses bear a proportion of about five-eighths to the aeendust: the rates were fixed by a survey (called sunchnee mukta) under the Native Government, and are considered in the sweet rice land or oothlapat to be in force for twenty-one years, and in the bagayut or garden land seven years; but they have not been renewed since the lapse. The land is every year measured in those places where the produce is inferior, or where nothing at all has come up; and after the actual state of the crops has been ascertained, the revenue on the inferior description is calculated at reduced rates, and where there has been a complete failure the whole is remitted; the difference is then deducted from

* For explanation regarding these items, see page 5, under the head of "Productions."

the quantity of batty due to Government, and the remainder commuted to money, according to the market rates, and collected in the manner detailed under the head of "Modes of Collection." There is a little land in the oothlapat called khaireej mukta jumeen, which is let out periodically to the highest bidder.

In the kharapat, or salt batty lands, there are two descriptions of cultivation, viz. paenoo, which is the most extensive, and awnoo: the former means that in which the rice is sown after the germination of the seed, in contradistinction to the transplanting mode, and the latter that in which the plants are stuck into the mud with the hand (as in the oothlapat) at proper distances from each other—and this yields a better produce, but requires much labour.* The rates in the paenoo land, including petty cesses, vary from $1\frac{1}{2}$ to 10 maunds per pūcka beega or acre, and in the awnoo from 6 to 11 maunds; but this is not collected upon all the land, because the whole of the crops in the salt batty lands are annually surveyed, and on that which is found mamoorā, or up to the full cultivation standard, the above rates are levied, and that under the mark is assessed at reduced rates: *e. g.* on an acre of 25 pands being surveyed, the whole being under cultivation, it is ascertained, according to the scale laid down, that the crop is only the produce of 20 pands, so 20 pands are put down as mamoorā, and 5 pands as khurraba, or uncultivated.

The whole of the wurkus, rubbee, tag, and malwai is surveyed every year by the Tulatees or Native accountants, and the revenue is collected according to certain fixed rates.

In the bagayut land, there are three different systems of assessment: the first and principal one is that where the revenue is collected upon the trees (booddēna); the next is the kuleet system, where the revenue is taken on the produce of each tree by actual inspection of the number of cocoanuts; and in a very few places the revenue is on the land. Since the lapse of the State to the British Government, it has been found necessary to make a deduction in the rental of many gardens where the tax in kind on the cocoanut and other palms was found to be excessively high: this was done by taking off one-third of the quantity of cocoanuts, &c. due, and is continued at present by deducting one-third of the rent.

The Government grass land (kooruns) is annually let out by public auction.

To give an idea of the complicated way in which the revenue is calculated in the khureef land, the best plan would be to give the details on one beega (of 25 pands) or one acre of sweet rice, and one of kharapat land, taking the aeendust of the former at 10 maunds, upon which solely depends the amount of mostly all the other cesses; and at the same time, it would, perhaps, be as well to show the expense in cultivating, and the profit to the cultivator upon the same piece of land.†

* For particulars regarding the cultivation, refer to page 5.

† Mostly extracted from accompaniment to Agent's letter dated 21st March 1850, No. 180.

SWEET RICE LAND.

1st Sort, 1 Beega or Acre.

	Maunds.	Pylies.		Rs.	a.	p.*
Aeendust.....	10	0	Value of crops on the 1st February..	31	0	8
Babtee.....	1	6	Value of straw.....	3	5	1
Mooshira.....	0	3	Value of seed.....	1	3	3
Khuradee	0	10	Produce of second crops, i. e.			
			pulse, &c.....	5	12	0
	12	7				
Suwaee Wurtala, i. e. one-fourth			Total returns to farmer.....	41	5	0
of the aeendust and the above			Deduct Government rent, and			
cesses taken together.....	3	1½	expense in cultivating.....	30	13	1
Kussur, at 1 maund per khundie,						
on 12 maunds 7 pylies	0	7½	Balance.... Rs.	10	7	11
	16	4½				
Fuskee, at 1½ pylies per khundie,						
on 16 maunds 4½ pylies.....	0	1½				
	16	5½				
	Rs. a. p.	Rs. a. p.				
16 maunds 5½ pylies,						
commuted to money						
at the average commu-						
tation rate of Rs. 14						
per khundie.....	11	8 7				
Total rent of land.....	11	8 7				
Cost of cultivating.....	6	14 1				
Cost of reaping, threshing, &c...	9	4 5				
Cost of cultivating second crops,						
i. e. pulse, &c.....	3	2 0				
Total expense to the cultivator..	30	13 1				

2nd Sort, 1 Beega.

	Rs.	a.	p.		Rs.	a.	p.
Rent of the land.....	7	7	2	Value of crops on the 1st Feb.....	22	11	0
Cost of cultivating.....	5	10	6	Value of straw.....	3	4	7
Cost of reaping, threshing, &c...	7	9	8	Value of seed.....	1	12	10
Total expense to the cultivator..	20	11	4	Total returns to the farmer.....	27	12	5
				Balance.... Rs.	7	1	1

3rd Sort, 1 Beega.

	Rs.	a.	p.		Rs.	a.	p.
Rent of the land.....	4	15	7	Value of crops on the 1st February..	14	4	0
Cost of cultivating.....	4	4	3	Value of straw.....	1	11	5
Cost of reaping, threshing, &c..	5	0	0	Value of seed.....	2	6	6
Total expense to the cultivator..	14	3	10	Total returns to the farmer.....	18	5	11
				Balance.... Rs.	4	2	1

SALT RICE LAND.

2nd Sort, 1 Beega.

	Rs. a. p.		Rs. a. p.
Rent of the land.....	5 14 3	Value of crops on the 1st February..	11 7 10
Cost of cultivating.....	1 9 3	Value of straw*.....	....
Cost of reaping, threshing, &c...	2 11 6	Value of seed.....	0 15 5
Total expense to the cultivator..	10 3 0	Total returns to the farmer.....	12 7 3
		Balance ... Rs.	2 4 3

It is difficult to give an idea of the expense in the cultivation of the plantation lands, and even the above is not strictly correct, but "it is the nearest approach to the truth that could be arrived at after a lengthened investigation into the details of about a hundred different holdings."†

The rates of assessment in this district are exceedingly diversified, and are more than two hundred in number, so it would be difficult to exhibit them all in detail; but to give an idea of the subject, the following table, drawn up in as succinct a manner as possible, will I think suffice :—

Description of Crops or Cultivation.	Description of Tax.	Number of different Rates.	Maximum Rate per Beega or Acre.	Minimum Rate per Beega or Acre.
Khureef or rice land	Rent in kind on rice land.....	200	17½ maunds.	1½ maund.
	Money rental.....	15	Rs. 5 9 7	Rs. 2 5 4
Wurkus	Money rental	3	" 1 8 0	" 1 0 0
Rubbee	Rent in kind	1	1 maund.	1 maund.
	Money rental	8	Rs. 2 3 0	Rs. 1 0 0
Tag or hemp	Rent in kind	1	2½ maunds.	2½ maunds.
	Money rental	2	Rs. 8 11 11	Rs. 5 0 0
Malwai	Money rental	3	" 5 0 0	" 1 0 0
<i>Bagayut.</i>				
Booddena	Money rental	8	Per tree Rs. 1 8 0	Per tree Rs. 0 4 0
Jumeendena	Money rental	3	Per beega ,, 1 8 0	Per beega ,, 0 8 0

Regarding the kuleet system, which has not been exhibited in the above, the following extract from the late Agent's report on the bagayut will give an accurate idea of the oppressiveness of this description of assessment. It is worthy of remark, that all the plantations on which the kuleet rates are assessed are fast falling into decay; and were it not that there is prospect of a revision of the assessment being introduced into the bagayut before long, by transferring the tax from the tree to the ground, the plantations would doubtless have been abandoned altogether.

* The straw in the salt batty land is seldom reaped.

† Agent's letter, dated 21st March 1850, No. 180.

Let it be assumed that 300 cocoanuts are counted ; then the State's share would be 200, and the grower's share 100.

	<i>Rs. a. p.</i>		<i>Rs. a. p.</i>
The State's share is then converted into money at a fixed rate of Rs. 1-14-0 per 100 nuts, or	3 12 0	Assume that the grower realizes in the market Rs. 2-4-0 per 100 nuts (a high average price) on the spot, then 300 nuts at Rs. 2-4-0..	6 12 0
Add additional cesses, viz. customs on the whole produce, at 1 anna per 100 nuts, or	0 3 0	Deduct loss to the grower on 300 nuts at 10 per cent., (the State giving credit of 100 only for every 110 nuts,) or 30 nuts, at Rs. 2-4-0	0 10 9
Nuffa, a cess (literally profit) ..	0 7 0	Deduct the State's dues	4 14 3
Sir Deshmookhee, a cess at 10 per cent. on the 3 first items..	0 7 0		<u>Rs. 5 9 0</u>
Potlaware, a cess at Rs. 1-9-0 per cent. on the foregoing four items ..	0 1 3	Remaining to the grower on every 300 nuts	1 3 0
Total payable to the State on 300 nuts	4 11 3		

The following extract from the report above alluded to shows most forcibly the depressed state of the plantations :—

“ This analysis, which is here given in strict accordance with the actual practice of assessment in force, will, I am humbly of opinion, plead better for the necessity for abrogating the kuleet or periodical survey, and its concomitant system of taxation in Colaba, than any arguments, however lengthy or forcibly urged. It fully bears me out, I would fain hope, in whatever I have stated, in my annual revenue reports to Government, regarding the depressed state of the bagayut of this capable district. It has left the plantations unproductive, from the means of irrigation becoming deteriorated and neglected ; and it has led to the necessity of allowing yearly remissions (quite disproportioned, it is true, to the urgency of the case) ever since the lapse of the late Government.”

Indeed, mostly all the rates throughout the district require remodelling and reducing.

The Government has already taken it into consideration, and the kharapat or salt batty land has undergone a complete survey and classification, and before long a new set of fair and equitable rates will be introduced, to the great benefit both of the cultivators and Government.*

A proposition is also now before Council for surveying and classifying the whole of the bagayut, and before many years pass over we may expect to find this valuable piece of country thriving under lower rates, and an increased revenue, for there is abundance of every description of land lying waste, and the proximity of the district to Bombay gives it many advantages over the other

* The revised and reduced rates here alluded to have since received the sanction of Government, and been fixed for twenty years.—*Ed.*

districts. It is, however, to be remarked, that since the introduction of the British rule, a great number of cesses have been abolished, particularly those belonging to the sayer revenue, (such as ghurputtee, or hearth tax, gadee jumbakoo, or tobacco tax per house, and kap rupeè, or tax to reimburse a certain Ranee for a lost ear-ring, &c.) in all amounting to upwards of Rs. 35,000, making a clear remission at once of more than one-twelfth of the revenue; and this remarkable decrease in the diagram opposite page 23 will strike the eye at once.

Sayer revenue consists chiefly of liquor contracts, and ferry farms, and these are annually let out to the highest bidder.

Sources of Revenue, and Produce of each Tax.—In speaking of the sources of revenue, I must divide them under two heads, viz. land and sayer. The former being the largest in amount, and of greater importance than the sayer, I shall commence with it first. The annexed is a diagram (No. 1) showing *exclusively* the annual amount of land revenue of the two talookas of this Agency for thirty-four years. The information was compiled with great care and labour from the old accounts of the late State, and the jumabundee papers since the lapse. This diagram, which illustrates the fluctuations of the revenue each year better than the most elaborate statement could do, does not require much explanation. The difference between the two averages (thick dotted line and thick black lines) amounts to Rs. 35,225, and is so far favourable to the system which has been adopted since the lapse; but salt, which, I apprehend, should come under the head of land revenue, is not included in the diagram, but is shown separately under the head of “Manufactures.” The fluctuations are not so great for the period that Colaba was under British management as when under Native rule, nor are the depressions so great during unfavourable seasons. The exact amount of revenue for each year is given in figures at the bottom of the diagram.

The following is a table showing the produce of each tax for four years, placed in juxtaposition: the two first years are those of Native rule, and the two last British :—

Names of Cesses.	Under Native rule.				Under British rule.				Explanations.
	1824-25.		1836-37.		1844-45.		1845-46.		
	Rs.	a. p.	Rs.	a. p.	Rs.	a. p.	Rs.	a. p.	
1. Aeen jeenus bhat babtee suheet	1,77,699	7 2	2,10,674	15 9	1,13,718	15 10	1,26,893	11 6	Batty in kind (including the aecendust and petty cesses).
2. Bagayut. . . .	27,482	6 3	25,543	4 6	20,961	7 8	20,544	7 1	Plantations or garden land.
3. Meet	5,883	10 10	735	7 3	877	9 11	673	8 1	Salt.
4. <i>Jhamp</i>	4,808	15 8	3,390	3 3	....	•	....	....	Levy of cadjans on cocoanut trees.
5. Nugdee jumeeneecha dhara	3,975	6 0	5,737	4 0	6,502	10 7	6,150	4 9	Fixed revenue in <i>cash</i> .
6. Rubbee	1,115	6 0	1,450	8 3	694	10 8	687	3 5	Second crops.
7. Pahanee khurch	1,103	12 0	990	13 6	157	5 9	133	12 8	Balance of survey cess.
8. Toop gowlee chowata. . . .	1,056	9 6	278	2 0	120	9 0	146	13 5	A tax on milch buffaloes.
9. <i>Moghun chud</i>	1,048	5 0	187	5 3	....	....	....	....	An indefinite levy on the cultivators. The amounts for the years 1844-45 and 1845-46 have been included in items Nos. 1 and 2.
10. Kheerkole ootpun	941	10 0	39	9 0	13	4 9	8	11 9	Miscellaneous produce.
11. Oodeed	622	12 0	....	....	....	....	....	....	Sale of oodeed (a grain) remaining in store.
12. Warkus. . . .	575	5 3	1,149	1 9	1,142	9 5	1,116	0 10	Hill cultivation.
13. Goor churun	376	10 9	151	5 0	198	4 0	16	0 0	Pasture land or grazing tax.
14. Naglee	261	4 8	....	....	....	....	....	....	Sale of naglee (a grain) remaining in store.
15. Wurree	131	14 0	....	....	....	....	....	....	Ditto.
16. Mooshira, Koolkurnee. . . .	126	2 0	88	3 6	719	7 11	799	13 9	Confiscated wutuns of Koolkurnees.
17. Bandhun mukta	117	3 9	....	....	....	....	....	....	New land brought under cultivation.
18. Tag	56	6 9	133	10 9	262	2 10	311	11 1	Hemp.
19. Teel	49	8 6	....	....	....	....	....	....	As No. 14.
20. Huk, Patel	48	6 0	48	6 0	1,035	3 0	1,186	13 11	Amount of confiscated and lapsed portion of Patels' haks.

21. Inam	43 14 9	49 0 0	10,781 8 7	11,972 6	3	Inam villages credited and debited in accounts. The items for the years 1824-25 and 1836-37 have been included in Nos. 1 and 2.
22. Istarwa	36 8 3	....	....	....		Progressive increase in rates on land held in lease.
23. Tooree	33 15 6	....	....	....		As No. 14.
24. Malwai	24 15 6	33 7 0	38 11 11	32 11	9	Second crops.
25. Khar deeghee mukta ..	20 0 0	....	....	....		On new land brought under cultivation.
26. Mud	16 8 4	....	....	....		Honey.
27. Mahajun	15 0 0	15 0 0	....	....		Amount of lapsed and confiscated portion of Mahajuns' wutuns.
28. Toop oodeed	11 0 0	2,616 13 3	....	....		A levy of ghee and oodeed on cultivators, commuted for a money payment.
29. Hukdaree	9 1 6	....	....	....		A per-centage on the land revenue on account of Hukdars.
30. Kandai	8 14 4	9 0 0	4 0 1	3	3	Onions.
31. Gullaiputtee	8 14 3	169 0 6	146 2 1	85 11	5	A levy on the assessment paid in kind in hashweera khar only.
32. Hurreek.. ..	7 15 11	....	....	....		Sale of hurreek (a kind of grain) from the stores.
33. Dhunai	7 12 6	....	....	....		Ditto
34. Mafee bhurlai jumeenee-cha akar	4 2 9	....	....	....		Amount collected from land on expiration of lease.
35. Furokt lakdai	3 10 0	23 7 9	5,539 6 0	3,689 14	5	Produce of sale of Government timber from forests.
36. Chinch	1 1 9	....	....	....		Tamarind.
37. Tad .. ..	....	440 14 3	....	....		Palmyra trees.
38. Bagh shairya .. ..	....	161 8 9	424 9 11	543 7	11	Produce of Government gardens.
39. Karsace.. ..	....	93 11 6	....	....		Various levies made in kind.
Carried over.....	2,27,734 9 5	2,54,210 2 9	1,63,388 11 11	1,74,996 7 7		

Names of Cesses.	Under Native rule.				Under British rule..				Explanations.
	1824-25.		1836-37.		1844-45.		1845-46.		
	Rs.	a. p.	Rs.	a. p.	Rs.	a. p.	Rs.	a. p.	
Brought over....	2,27,734	9 5	2,54,210	2 9	1,63,338	11 11	1,74,996	7 7	Amount remaining in hand after sale of estates for Government dues. Sale of Government grass land. A grazing tax on non-cultivators. A levy in kind upon leaves of the palmyra tree. A tax on the ground occupied by vessels (not belonging to Colaba) housed in the monsoon. Deposit in kind. Surplus revenue.
40. Sadhnook.. ..	....		35 2 3		....		....
41. Koorun mukta..	....		....		114 12 0		94 5 0	
42. Wun tukka.. ..	....		....		65 8 0		65 0 0	
43. Tadkee khorla ..	....		....		1 14 0		4 6 4	
44. Bhoose bhadaai ..	....		....		146 14 3		206 13 3	
45. Amanut khureef ootpun	....		....		10 0 7		7 5 7	
46. Surplus .. ..	....		....		2,374 14 3		5,294 11 5	
Total....	*2,27,734	9 5	*2,54,245	5 0	1,66,052	11 0	1,80,669	1 2	• This includes salt.

The cause of the items printed in *italics* being only shown for two years is not owing to their having been abolished, or not being in force for the two years that are blank, but merely owing to their having been mostly included in items Nos. 1 and 2; and the accounts not being clear with regard to their exhibition, their amounts could not be shown separately in this statement.

The only thing that is to be remarked with regard to the information contained in the diagrams is, that under the Native State, the revenue having been taken in kind, and so exhibited in the accounts, it was difficult to render the same in cash, as there is no trace in the old papers for some years of the money which the revenue in kind brought, owing to the rates at which it was sold not being given: in such cases, the market rates of grain, &c. were ascertained by reference to the books of the principal grain merchants, or, when this failed, the average of the rates ascertainable of the other years was taken; and this, though it does not give the exact amount, yet it cannot be far off the truth, as the quantity of grain, &c. was ascertained after the most careful investigation of each item. There were other pieces of territory, viz. Peta Sacc, and the village of Kaloos, &c. which since the lapse were transferred to the several zillahs in which they were situated, and so the revenues from these places have been excluded from the diagrams, which only show the accounts for the two talookas that now form the Colaba Agency.

The annexed is a diagram (No. 2) showing the amount of sayer revenue, including customs of the Agency, for thirty-four years. This exhibits a most remarkable decrease for the years under British management, and is to be accounted for, as before stated, owing to the total abolition of many petty cesses. The details of the produce of each tax under this head would occupy much space, and take up more time than I can now devote to the subject; but I trust that the diagrams will make up for any deficiency here in the remarks, which I had intended to have been more copious.

The very great remission in this description of revenue ought to have had a beneficial effect upon the country in general; but the result has not been so favourable as might have been expected, by the abandonment of such a large number of cesses; but perhaps it has not had time enough to bring about a change, and after the expiration of a few years, and on the introduction of new surveys of the land, we may find the people in a more prosperous state. However, there is sufficient to show that the line of policy since the lapse has been liberal, though it cannot be said that the rates of revenue now in force are low,—on the contrary, they are much higher than those in force in the surrounding districts of the Tanna zillah; and were it not that the soil is proverbially fertile, the people would long ago, even under the Native Government, have been reduced to the direst poverty; in fact, they could not long have existed under such a system: it is, indeed wonderful how they have so long continued with such apparent prosperity, and this can only be ascribable to the clever administration of the late ex-Dewan Venaik Purushram, who was more versed in the revenue matters of the country than any other man in it.

However, his policy could not have lasted very long, for the country was commencing to show visible signs of a falling off; and the almost total decay of a great part of the plantation villages evidently showed that the country was labouring under bad management and ruinous taxes.

The annexed diagram (No. 3) gives an accurate view of the whole subject for thirty-four years, and the average of the amount reduced since the lapse is Rs. 87,073. This shows *every* description of revenue, including salt and customs, and therefore the comparison of both systems is perfect.

Mode of Collection.—With the exception of koorun (grass land) and forest proceeds, the Tulatees receive in the first instance all collections of money. The amount is brought to the Tulatee, who credits it in his keerd, in the presence of the Patel, and the money is duly acknowledged on the ryot's receipt book, signed by the Patel and Tulatee, which is afterwards returned. The amount, on being forwarded to the Mamlutdar, is entered in the keerd, and then in the khata, or alphabetical register journal.

The system of collecting the land revenue by instalments in the khureef and dry crops was introduced into this district after the lapse of the State. It was done with a view of accommodating the ryots' payments in money in lieu of grain due upon khureef lands and dry crops, and these, together with the established money land taxes, are much like the system in force in the neighbouring districts of the Tanna zillah. The instalments are distributed as follows :—

For the khureef or monsoon and dry crops—January 2 annas, February 4 annas, March 6 annas, and April 4 annas per rupee due.

In the bagayut or plantation land the assessment is divided into equal portions for every month of the year throughout all the garden plantations, with the exception of Cheol, where there are three instalments, respectively commencing on the second and third months after the Mirgsal, or 5th June. The system of the bagayut revenue instalments is of very old date, and as they were represented to be favourable to the people, no alteration was made.

The collection of the sayer revenue is made by instalments of equal portions for every month throughout the year. Items of mohturfa are collected by the Tulatees in the same manner as land revenue, and amounts of contracts, such as ferry farms, abkaree (liquor contracts), and ganja, &c. are collected by the Mamlutdars from the contractors.

Fees in lieu of stamps in civil cases are collected by a Karkoon of the duftur, who keeps an account of the amounts received, and after the closing of the day's books the money is sent to the Agent's general treasury.

The following is a list of the establishment employed in the collections :—

Tulatees or Native accountants	39
Assistant ditto	3
Peons	41

Total.... 83

The above is superintended by two Mamlutdars, and the Agent and his hoozoor duftur office.

PART III.

FORESTS.

The teak and blackwood forests of Colaba are very valuable, not only from their great extent (considering the small size of the district), but also from the good description of wood they produce, which has been pronounced by competent judges to be the best of its kind grown in the Konkun, and the teak only inferior to the Calicut wood. "The principal forests are respectively known as the Mahan, Bellosee, and Chaora jungles, and these extend uninterruptedly from a point immediately east or inland of Alibagh to the south-east limits of the Colaba State. These jungles lie mostly on the summits and along the western slopes of the hills, which run lengthways, *i. e.* from north to south-east, through Colaba. But there are besides minor jungles, containing thousands of promising young teak trees, running north from behind Alibagh through the pass named Carlee Khind, and thence eastward in amphitheatres along the skirts of the hill fort of Sagurghur, and on to Samree Khind, on the left bank of the Nagotna river."*

These forests are doubly valuable from their proximity to Bombay, being in fact within the mouth of the harbour; and the Government dockyard has since the lapse been supplied every year with large quantities of wood from them.

The knees or curves are represented to be particularly adapted for the building of small vessels.

The following is a list of all the principal trees that grow in the Colaba forests, which I have drawn up from information supplied by the Forest Karkoon :—

* Extract paragraph 3 from Political Superintendent's letter to Government, dated 24th September 1842, No. 65, Secret Department.

TIMBER, adapted for House and Boat-building Purposes.				FIREWOOD, &c.	
Names.		Peculiarities of each description of Wood.	Uses to which applied.	Names.	
सग	Sag (teak) ..	Too well known ..	House and boat-building purposes.	उबर	Oombur.
सीसवा	Seeswa (blackwood) ..	Ditto ; smoke from, used medicinally ..	Furniture and house-building.	सावरी	Sawree.
खरसिंगा	Khurseeng ..	Yields a medicinal oil ..	Posts, beams.	सेलाट	Sailat.
ऐन	Aeen..	Very hard ; not very durable in water ..	Ditto and rafters.	पारंगा	Parunga.
जांबा	Jamba ..	.....	Ditto ditto.	वड	Wud.
नाणा	Nana ..	.....	Ditto ditto.	पलस	Pulus.
होदी	Haidee ..	Close-grained and smooth ..	Planks, beams.	कालकुडा	Kalkooda.
कोजळ	Keenjul ..	.....	Posts, beams.	बाझा	Bahya.
घावुद	Ghawud ..	.....	Ditto ditto.	कुंभी	Koombee.
कुलुंब	Kulumb ..	Not very durable ..	Ditto ditto, and planks.	पायरी	Paereee.
धामुन	Dhamun ..	Durable under ground ..	Ditto ditto, and rafters.	भोकरो	Bhokree.
कुरुम्बुल	Kurumbul ..	.....	Ditto ditto.	कुडका	Koodka.
खैर	Khair ..	Very hard ; durable under ground ..	.....	भुरकुडा	Bhorkooda.
		and in water ..	Carts, water-wheels, and posts.	घायटो	Dhaytee.
आंबा (maugoe)	Amba (maugoe) ..	Not durable ..	Planks and beams.	रानणी	Rannee.
जाम्बुल	Jambhul ..	.....	Posts and beams.	कानू	Kanoo.
धवळ	Dhawla ..	Not very durable ..	Ditto ditto, and rafters.	कोरमोरी	Keormeeree.
फणुस (jackwood)	Phanus (jackwood) ..	Close-grained and smooth ..	Furniture planks, and beams.	बोखाडा	Bokhada.
भेंडे	Bhende ..	Straight ..	Spokes for wheels, and other cart work.	तुतुदुदे	Tutuddee.
सेरुन	Seerun ..	Light ..	Toys, and light furniture.	मोहोटी	Mohotee.
सेरुन	Seerun ..	.....	Posts, beams.	आपटा	Apta.
कोसुम्बा	Kosumba ..	Yields a medicinal oil ..	Ditto ditto.	माचळ	Machul.
डोन्की	Doonkee ..	Not durable ..	Posts.	साल्होले	Saldholee.
पोन्ने	Poonnee ..	Very durable in salt water ..	Fishing-stakes, masts, &c.	निगडी	Neegdee.

मोहो	Moho	...	Not durable ; flower used as a medicine ..	Used for huts.	कारवी	Karwee.
आसाणा	Asana	...	Durable in water ..	Frames for wells, water-wheels, &c.	आमटी	Amtee.
वारस	Warus	...	...	Making measures of capacity.	पांढरी	Pandhree.
पाडळी	Padlee	...	...	Beams and posts.	खबरी	Sukharee.
बोवळी	Wowlee	...	Durable in water ..	Canoes, general house-building.	खबरी	Khowsee.
कीनर	Keenag	...	Durable in salt water ..	Fishing-stakes.	नांदरख	Nandrook.
दुहिवार	Duheewad	...	Good as teak ; durable under ground	General house-building.	आष्ट	Asht.
अंबानी	Ambanee	...	...	Posts.	वडेख	Waihal.
गोयडा	Goyda	...	...	Ditto.	करज	Kurrunj.
गोवळा	Wowla	...	...	...	तडेवा	Tudaiwa.
साजेरी	Sajereee	...	Not durable ..	Sometimes for canoes.	आवळी	Awlee.
मागटी	Magtee	...	...	Sometimes in house-building.	घोटी	Ghotee.
चांदवा	Chandawa	...	...	Ditto ditto.	आदुरणी	Atoornee.
आसी	Asee...	...	...	Ditto ditto.	कुटा	Koota.
पाचाबा	Pachawya	...	...	Posts.	करंदो	Kurrundee.
साविणा	Satweena	...	Light ; used in medicine ..	Seldom used.	शेणखेरा	Shainkhira.
धूप	Dhoop	...	Aromatic smell when burnt..	Ditto.	भुला	Bhootwa.
देकासाडी	Deekamalee...	...	Medicinal property ..	Ditto.	खरवती	Khurwutee.
निगड	Neegud	...	...	Posts.	नागचापा	Nagchapa.
हरया	Hurdy	...	Medicinal ; used in chunam	Posts and beams.	आलावणी	Alownee.
यसुर	Yaisur	...	...	Fine work ditto ditto.	भुरवडा	Bhoorawda.
वेळका	Wailka	...	Durable in water ..	Posts, beams, &c.	सिकेकारं	Seekakae.
रोडी	Regtee	...	Soap nut ; medicinal..	Ditto ditto.	कादल	Kadul.
बोवळा	Beebla	...	Durable ..	Posts, and general house-building.	वडणी	Wudgee.
करपा	Kurpa	...	...	Very seldom used.	चीखली	Chickhlee.
			...		कापुरमेडी	Kapoorbhandee.
			...		गुले	Gulee.
			...		कुलारणी	Koolarnee.
			...		आळू	Aloo.

Mr. Davies in another part of the report above quoted says in paragraph 9 :—"With regard to the question of augmenting the timber with a view to future supplies, I beg to state that I have consulted many experienced Natives on the subject, who concur in stating that, as a general maxim, planting is quite unnecessary unless for propagating trees where none at present grow. The seeds of the teak being scattered by the wind through the jungles, an unlimited supply of young seedlings is at all times procurable for such a purpose, but in the jungles themselves a spontaneous reproduction is constantly going on. No doubt future observations will point out many eligible sites for marking out fresh plantations.

"Under the former Government, though the strictest precaution existed for preventing private individuals cutting down trees, and heavy penalties were inflicted for infraction of the rules, yet the late ex-Dewan, a few years before Colaba lapsed to the British, cut down a great number of valuable trees, which it is supposed he removed by degrees from the forests, and sold on his own account."*

PART IV.

METEOROLOGICAL AND MEDICAL STATISTICS.

Atmosphere and Climate.—The proximity to Bombay would render any particular notice of the climate of this small district unnecessary, were it not that the temperature is affected to a considerable degree by the line of hills which run through it north and south, dividing it nearly into two equal parts. The valleys and deep ravines under these hills are much hotter than the plains open to the sea breeze, and the highest points, viz. those of Sagurghur and Kunkeshwur, enjoy a far superior climate to any place on the island of Bombay.

The subjoined is a table of the meteorological observations taken at Alibagh, exhibiting at one view the averages for the years 1847, 1848, and 1849 :—

* Political Superintendent's letter to Government in the Secret Department, dated 6th May 1842, No. 48.

Months.	THERMOMETER. Average for three Years.				PLUVIOMETER. Average for three Years.			Prevailing Winds.	Remarks, &c.
	Minimum during the Month.	Maximum during the Month.	Mean of Daily Minima.	Mean of Daily Maxima.	Mean Daily Range.	Quantity of Rain.	Number of Days on which Rain has fallen.		
January ..	65°	82°	71°	78°	7	In. cts. ..	..	N. and NW.; E. in the morning.	Nights and mornings cold and chilly; strong northerly winds prevail; weather generally clear, occasionally cloudy; heavy dew at night; mornings foggy.
February ..	65	82	72	80	8	..	..	Ditto ditto.	Ditto ditto
March	73	87	77	84	7	..	..	Ditto ditto, and N.E.	Generally cloudy and sultry in the day; heavy dew at night.
April	78	89	80	87	7	..	..	NW.; occasionally SW. and E.	Ditto ditto; a good deal of lightning to the eastward.
May	80	91	82	88	6	1·67	7	NW., NE., and SW...	Towards the end of the month dense masses of clouds, with occasional thunder, lightning, and a little rain.
June	78	88	80	84	4	32·74	26	SW., and sometimes W.	Very cloudy and oppressive atmosphere; squally weather, with thunder, lightning, and heavy rain.
July	78	86	80	83	3	25·44	26	SW.....	Sky densely overcast; very squally weather, accompanied with very heavy rain.
August.....	77	85	78	83	5	11·63	25	Ditto	Cloudy; passing showers; occasional sunshine.
September..	74	84	76	82	6	10·2	15	SW., NW., and WNW.	Cloudy; light passing showers; sometimes heavy rain.
October ..	76	87	80	86	6	3·46	4	NNE., NW., and E....	Days close and oppressive; nights particularly so; cloudy; thunder and lightning, with a few heavy showers.
November..	72	86	76	85	9	..	..	NNW., NE., and E...	Nights clear; mornings cold and chilly; days cool.
December..	64	84	72	82	10	..	..	N., NE., and variable.	Ditto ditto
						84·96	103		

The exact height of Sagurghur has not been ascertained : a mountain thermometer, however, shows the boiling-point to be 209.9° , which indicates 1,164 feet, whereas the barometer falls $1\frac{1}{4}$ inch, which would give upwards of 1,400 feet at a rough estimate. The atmosphere of this hill during the fair weather is remarkable for its dryness, and the thermometer shows generally that it is about 5° cooler than Alibagh, until the mists arise, towards the end of April and May, when the difference is more marked. It is, however, during the months of June, July, August, and September, that the greatest alteration takes place, showing an average of 10° below the range of Alibagh. In October it is frequently hotter, and, from its extreme dryness, more unpleasant than the low country, though it is far more healthy, being free from exhalations, and open to the wind from whatever direction it may blow. The fall of rain registered during the monsoon of 1850 was about 70 inches.

Alibagh is situated on a low belt of sand on the sea beach, in latitude $18^{\circ} 40'$, and longitude $72^{\circ} 59'$, and is bounded on the north, west, and south-west sides by the sea. It is exposed to the strong sea breezes which prevail the greater part of the year, and which also tend much to make the temperature more equable than in most places in the interior : the average daily range of the thermometer for the last three years gives the mean maximum at 10° , and the mean minimum at 3° .

The jail, lines of the police, and houses situated on the beach, are exposed to the beneficial influence of the sea breeze, consequently it is healthier in those localities than in the town, which is surrounded by plantations of the cocoanut palm, and thick underwood, which are allowed to grow in all their luxuriance, impede the circulation of air, and make the town less healthy than it otherwise would be. The highest range of the thermometer within the last five years was on the 11th May 1848, when it indicated 92° in the shade, and the lowest on the 20th December 1846, when it fell to 64° ; the annual average fall of rain for the three years ending 1849 is 84 inches and 96 cents.

The weather is oppressive and enervating in the months of May, June, and October, and up to the middle of November : in July, August, and September, it is also very steamy and hot immediately after a temporary cessation of rain ; it is, however, cold and damp when the rain is at all continuous during this period. The monsoon commences about the first week in June, and is ushered in by dense masses of dark clouds, high hot winds, thunder and lightning, and terminates in the beginning of October, accompanied with the same kind of phenomena, but only of a few days' duration. The cold weather sets in about the middle of November, and ends in February—March, April, and May being considered the hot months ; but it is seldom that it is uncomfortably warm till May, and upon the whole the climate of this place may be considered as healthy as that of most districts lying on the sea coast. From January to the second week in May the sky is generally clear, heavy dews falling at night up to the month of March ; it is also occasionally cloudy. In

the end of May and the early part of June, large masses of electrical clouds, emitting vivid sheet lightning at night, are seen piled up to the eastward above the range of the Ghauts. From this period to September the sky is almost always overcast with large masses of dark clouds, passing over from a south-westerly direction, with almost continuous downpours of heavy rain and squally weather, the latter being always at its greatest height during the end of June and throughout July. In October the elephants terminate the monsoon, and this is the most unhealthy season of the year, the atmosphere being surcharged with electricity, and the motion of the air almost quite suspended: the nights are sometimes close and oppressive. It is occasionally cloudy in November and December, with strong northerly winds during the day; nights usually still and clear, attended with very heavy dews, and foggy mornings.

Prevailing Winds.—In January, February, March, and April, the wind blows chiefly from the north and north-west. In the early part of the mornings gentle land winds spring up, and last sometimes for a few hours. In the end of April a strong dry and parching northerly wind prevails for a few days, the thermometer sometimes attaining 100° at mid-day in an open veranda with a northerly aspect. In May the wind generally blows from the north-west, sometimes veering round to a south-westerly direction. From June till September it blows very strong from the south-west, with little variation. In October it varies from north-west to north-east. A strong north and north-easterly wind sets in pretty steadily from the beginning of November to the end of December, which is occasionally dry and unpleasant.

Health and Disease.—In the criminal jail at Alibagh, fevers of the simplest form occur occasionally among the prisoners; those of the remittent type are rare. 98 cases of fever were admitted into the jail hospital during the years 1817, 1848, and 1849, 85 of which were of the ephemeral and continued form; 13 cases of remittent, 3 of which proved fatal, but these were of a complicated character, the brain, liver, and other important viscera being more or less involved. 40 cases of diseases of the stomach and bowels were admitted during the above period: of that number one man died from colliquative diarrhœa merging into atrophica.

Phlegmon, Ulcers, and Contusions.—Under these heads there have been 86 admissions during the three years. The swellings, abrasions, &c. occurred chiefly from the careless manner in which the prisoners wear the fetter-sacks, for the purpose of obtaining a few days' rest in hospital. 28 cases of guinea-worm were admitted during the above period. These were treated on the Native principle, viz. poulticing, fomentations, &c. when the parts were swollen, and before the worm made its appearance: after the worm protruded, the cold water applications, frictions, excisions, and gentle extraction were the only remedies to which recourse was had. This is a common disease among the Natives of all classes in the monsoon: women and children are more exempt from it than men.

Not a case of cholera has occurred in the jail for the last four years commencing from May 1846, although it appeared in a very severe form two years successively previous to that period.

The following is the diet table of the convicts :—

	Hard Labour Prisoners.	Without Labour, and Women.
Rice.....	1 lb. 8 oz.	1 lb. 3 oz.
Dholl	4 oz.	3 oz.
Vegetables	4 oz.	4 oz.
Curry-stuff	$\frac{1}{2}$ oz.	$\frac{1}{2}$ oz.
Salt	180 grs. .	180 grs.

Ghee and oil alternately $1\frac{1}{2}$ oz. to every 10 men, $1\frac{1}{2}$ oz. to every 10 women.

Wood 2 lbs. „ „ 2 lbs. „ „

Fish 8 oz. once a week, in lieu of some other portion of their diet.

They are also served out with clothing periodically, as shown below :—

	Hard Labour.	Without Labour.	Women.
Cumlies or blankets...per prisoner	2	2	2
Angrakas.....	1	..	..
Dhoties	1	1	..
Caps	1	..	..
Cholees .....	..	..	1
Saries .....	..	..	2

These are renewed twice a year, or when worn out.

The jail and hospital accommodation is excellent, and there is an abundant supply of good water from two wells, one inside and the other without the jail. The prisoners bathe every day, and once a week are marched down to the sea for the same purpose. Cleanliness in their cells, clothing, &c. are well attended to. The regular and sufficient quantity of plain and wholesome food, with light work on the roads, tend to keep them in the best of health. The returns published by the Sudder Foujdaree Adawlut for the year 1848 show that the small criminal jail at Colaba has far fewer deaths in proportion to the strength than any of the jails under this Presidency; the per-centage of deaths to strength being, in 1848 1·449, and in 1849 3·030.

Return of Admissions and Deaths among the Prisoners in the Colaba Jail for the Years 1847, 1848, and 1849, classed according to their Caste and Country.

Caste.	Country.	Average Daily Strength of each Class for 1847, 1848, and 1849.	Admissions of each Class in 1847, 1848, and 1849.	Deaths of each Class in 1817, 1818, and 1819.
Native Christian ...	Konkun	1	2	...
Mussulman... ..	Bombay	1	2	...
	Sciude	1	1	...
	Konkun	1	10	...
Hindoo	Deccan	5	9	...
	Hindoostan	1	7	...
	Konkun	56	286	6
Total..		66	317	6

Table exhibiting the Number of Admissions and Deaths of the Convicted Prisoners in the Jail of Colaba, from each Class of Disease, for the Years 1847, 1848, and 1849.

[Aggregate Strength 65.]		1847.		1848.		1849.		Total Admissions of each Class.	Total Deaths of each Class.
CLASS.	DISEASES.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.		
Fevers	Febris ephemera.....	16	..	31	..	15	..	98	3
	„ intermittens quotidiana ..	3	..	..	..	..	..
	„ „ tertiana ..	1	..	..	..	..	..
	„ remittens	1	1	2	1	6	1		
	„ continua complicata.....	19	..	..	..	1	..
Diseases of the Lungs	Catarrhus acutus	3	..	4	10	..
	Asthma .....	..	..	..	..	3	..
Liver	Icterus	1	1	..
Diseases of the Stomach and Bowels	Dysenteria acuta.....	1	..	3	40	1
	Dyspepsia	1	..	2	..	..	..
	Colica	11	..	9	..	4	..		
	Diarrhoea	1	1	6	..	2	..		
Rheumatic Affections.....	Rheumatismus acutus	2	..	2	..	3	..	8	..
	„ chronicus	1	..	..	..	..	..
Diseases of the Brain	Paralysis	1	1	1	1
Dropsy	Anasarea	1	1	..
Abscesses and Ulcers	Phlegmon et abscessus	12	..	14	..	16	..	74	..
	Ulcers	8	..	21	..	3	..		
Wounds and Injuries	Vulnus incisum	1	..	3	..	2	..	12	..
	Contusio	1	..	4	..	1	..		
Punished	Punitus	16	..	16	..
Diseases of the Eye	Ophthalmia.....	3	..	4	..	5	..	12	..
		
Diseases of the Skin	Psoriasis	3	..	3	6	..
Other Diseases.	Atrophia	1	1	38	1
	Cynanche tonsillaris	1	..	..	..	..	..
	Dracunculus ..	10	..	3	..	15	..		
	Hæmorrhoids.....	..	..	1	..	..	..
	Hæma	1	..	1	..	..	..
	Otitis	2	..	..	..	1	..
	Scorbutus .....	..	..	..	..	1	..
	Vermes .....	..	..	..	..	1	..
		
Total....		104	3	118	1	95	2	317	6

Proportions for the Year 1847.

Per Cent.

Proportion of admissions to the No. of prisoners.....	173.333
Ditto deaths to the No. of prisoners.....	5.000
Ditto average No. of prisoners to average daily No. of sick.	5.000

For the Year 1848.

Proportion of admissions to the No. of prisoners	171.014
Ditto deaths to the No. of prisoners.....	1.449
Ditto average No. of prisoners to average daily No. of sick.	5.343

For the Year 1849.

Per Cent.

Proportion of admissions to the No. of prisoners.....	143.939
· Ditto deaths to the No. of prisoners.....	3.030
Ditto average No. of prisoners to the average daily No. of sick for the year.....	5.178

*Return of Admissions and Deaths among the Prisoners in the Colaba Jail,
classified according to the Length of their Confinement at the time of their
Admission to Hospital, for the Years 1847, 1848, and 1849.*

Period of Confinement.	Daily Average Strength of each Class for 1847, 1848, and 1849.	Admissions of each Class in 1847, 1848, and 1849.	Deaths of each Class in 1847, 1848, and 1849.
From 1 to 3 months	12	58	1
„ 3 to 6 months	10	37	..
„ 6 months to 1 year	7	40	1
„ 1 year to 3 years	26	131	3
„ 3 years to 5 years	10	39	1
„ 5 years to 7 years .. ..	..	..	..
„ 7 years to 10 years	1	9	..
„ 10 years to 15 years .. ..	..	..	..
„ 15 years and upwards .. ..	..	..	..
Total..	66	317	6

The average strength of the police during the three years ending 1849 is 84. 45 cases of fever were admitted, as per subjoined Table A, in the three years, viz. 1847, 1848, and 1849: one, which was of the remittent form, proved fatal; one death also took place from liver, one from dysentery, and one from cholera; in all 4 cases in the period under review.

42 cases of dracunculus occurred in the above period. They were treated on the Native principle, as has been detailed under the head of guinea-worm in the jail report. The rest of the admissions were for disorders of a very trifling nature, and do not require remark.

The lines of the police are situated near the jail, in a very healthy spot, and the men enjoy excellent health: there is nothing either in the lines or management that requires improvement.

A.

Table exhibiting the Number of Admissions and Deaths of the Colaba Police Corps, from each Class of Disease, for the Years 1847, 1848, and 1849.

[Aggregate Strength 84.]		1847.		1848.		1849.		Total Admissions from each Class.	Total Deaths from each Class.
CLASS.	DISEASES.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.		
Fevers	{ Febris ephamera.....	21	..	7	..	1	..	45	1
	{ „ remittens.....	8	1	3	..	1	..		
	{ „ continua complicata	4	..	..	..	..	..
Diseases of the Lungs	{ Asthma.....	1	..	2	..	1	..	4	..
Liver	{ Hepatitis acuta .....	..	..	1	1	1	..	2	1
Diseases of the Stomach and Bowels.....	{ Dysentery acuta.....	..	..	5	1	1	..	11	1
	{ Dyspepsia	1	..	..	..	..	..
	{ Diarrhoea.....	1	..	1	..	..	..
Epidemic.....	{ Cholera .....	..	..	1	..	1	1	1	1
Diseases of the Brain	{ Paralysis .....	..	..	..	..	1	..	1	..
Rheumatic Affections.....	{ Rheumatismus acutus.....	..	..	..	..	1	..	1	..
Veneral Affections.....	{ Syphilis primitiva .....	..	..	..	..	1	..	3	..
	{ „ consecutiva	1	..	..	..	1	..		
Diseases of the Genitals	{ Bubo simplex	1	..	1	..	1	..	6	..
Abscesses and Ulcers	{ Gonorrhoea	2	..	1	..	..	..
	{ Phlegmon et abscessus .....	..	..	1	..	..	..	3	..
Wounds and Injuries	{ Ulcers .....	..	..	1	..	1	..		
	{ Subluxatio .....	..	..	1	..	1	..	3	..
Diseases of the Skin	{ Contusio	1	..	..	..	..	..
	{ Psoriasis	1	..	1	..	..	..	2	..
Other Diseases .	{ Dracunculus	7	..	25	..	10	..	46	..
	{ Hernia	1	..	2	..	..	..
	{ Hydarthrus .....	..	..	..	..	1	..		
Total....		50	1	53	2	25	1	128	4

The inhabitants of this Agency suffer mostly from fever, bowel affections, and cholera. The latter regularly makes its appearance in some one or more of the villages annually, and its visits are more markedly confined to towns and villages situated immediately on the sea beach, or near the banks of creeks. The only way to account for this is that places on the sea-shore are not so cleanly as those in the interior, the refuse of fish and other vegetable matter being more abundant, thereby tending to produce a more virulent description of malaria. I have frequently witnessed, on visiting patients in their houses afflicted with this disease, that large masses of dried leaves, &c. were piled up layer after layer near their dwellings, which, being allowed to remain untouched from year to year, and the rain and sun acting upon them and other heaps of filth, are

sufficient to make the air unfit for respiration. The houses are also generally without windows, and the basements very low. At night the inmates lie down, often on the damp mud floor, shutting in a good quantity of deleterious gases; and the habit of covering the head and face on going to sleep all tend to produce a feeling of suffocation, the first victims to this asphyxial form of cholera being the most weakly children, and women. The Natives seldom apply for medical aid till too late: the remedies employed by themselves are very simple, such as spices, carminatives, &c. with hot applications externally; and it is my humble opinion, that until the cleanliness of towns, &c. with an improved and a more airy style of building, are more attended to, cholera will always make its appearance in those places which have not these requisites. The Kolce or fisherman caste are more subject to cholera than any other class of people, owing to the causes enumerated above.

Table B exhibits in detail all the diseases in which the Natives of this Agency avail themselves of European medical aid, the benefits derived from which appear to be appreciated more and more every day, particularly in cases where they have failed in obtaining relief from their hakeems; and Natives now generally find it better to come at once for medical advice, both in surgical and medical cases, than to depend on the doubtful assistance of their Native doctors.

Abstract of Dispensary Return.

	Remained.	Admitted.	Total.	Discharged			Absented.	Died.	Remaining.	Average Daily Number.
				Cured.	Relieved.	Into Hospital.				
Christians ... ..	...	15	15	12	2	1	...	...	...	1
Mussulmans	2	27	29	26	3	...	...	...	...	1
Hindoos	2	96	98	80	2	...	3	12	1	3
Jews ... ..	...	5	5	4	...	...	...	...	1	...
Women of all castes ... ..	...	50	50	41	...	...	...	8	1	1
Children of all castes; both sexes under 14 years of age ... ..	...	57	57	44	1	...	...	11	1	1
Total...	4	250	254	207	8	1	3	31	4	7

PART V.

NAVIGATION, WATER SUPPLY, AND IRRIGATION.

Navigable Rivers.—There are none, and, except during the monsoon, there is not even a stream of fresh water in the district deserving the name of a river. There are two large navigable creeks, and a few minor ones, but of no importance. Small boats go up and down these with cargoes of grain, fire-wood, and salt, for the purpose of shipping them on board larger vessels, or taking these commodities from one village to another.

The two principal creeks are those of Nagotna and Rewdunda : the former divides the Agency from the Tanna zillah, and meets with the fresh water of the river about two miles from Nagotna, that is about 26 miles from the sea, or the mouth of the creek. It varies from three-fourths to one-eighth of a mile in breadth, and its banks are covered on both sides with a marine plant called jecwar. The creek is navigable as far as Nagotna for vessels of about 100 candies burden, during spring tides, and vessels of 60 candies during ordinary tides. The principal vessels employed on the creek are pattimars and muchwas, (*i. e.* fishing and passage-boats,) and bunder-boats for visitors going from Bombay to Mahableshtur. Pattimars are principally used for the transport of rice and salt, which are produced on both sides of the creek ; muchwas are mostly employed for conveying rice and firewood to the Presidency. They sail up the little tributary creeks, and go a good way inland for their cargoes. The Nagotna creek is very easy of navigation for about 20 miles ; the water being shallow higher up, it can only be ascended when the tide is in. The largest steamer might sail up this estuary for 10 miles, as far as Dhurumtur or Shabaj.

The Rewdunda creek, which separates Colaba from the Hubshee's territory, and the Rajpooree talooka of the Tanna zillah, varies from a mile and a quarter to one-sixth of a mile in breadth. It is navigable for boats of 80 candies burden as far as the village of Gophun in the Tanna zillah, which is nearly opposite to Chaora, of this Agency, and about five miles from Rohi Ushtumee, that is 13 miles from the mouth of the creek. Bunder-boats and small vessels of about 25 candies go up as far as Rohi Ushtumee ; larger boats can also go up there with the spring tides.

The creek is principally navigated by pattimars and other small boats, such as passage-boats and fishing vessels. They are chiefly employed in taking rice to the Southern Konkun and Bombay. Firewood, also, forms a large article of export. Fish is sent up to Rohi Ushtumee, where there is a good market, and whence it is transmitted into the interior.

These estuaries are well situated for the purpose of transporting country products to the different export towns.

Lakes.—There are no lakes in the district, although a few small ones might be made at the foot of the hills on both sides with comparatively little expense, which would in return realize a large revenue, by the means they would afford of rearing a superior kind of crop, and by ensuring a supply of water to those crops which are dependent on the periodical rains.

Canals.—There are no canals, nor are there any traces of any having ever existed. The district being almost entirely surrounded by the sea, the many creeks which run inland in every direction would appear to have superseded the necessity for regular artificial channels. Some of the creeks might certainly be deepened, but the present limited resources of the country do not call for or require any outlay in works of this description.

Tanks.—There are a good many tanks in the district, but none of them very large, and only a few that have water in them the whole year round. The following table has been compiled from information obtained from the Mam-ludars for the special purpose of being exhibited in this report :—

Classification of the Tanks.	Number of Months the Water lasts in the several Tanks.	Number of Tanks of each Class.	Circumference of the Tanks.		Condition of the Tanks of each Class.			
			Maximum size of the Tanks of each Class.	Minimum size of the Tanks of each Class.	In complete repair, with Sides built up with Stone and Mortar.	In an unfinished state, <i>i. e.</i> Sides not entirely built up.	Excavations without built-up Sides.	Total of Columns 6, 7 & 8.
1st	12 months, <i>i. e.</i> from June to May ..	37	Feet. 1,932	Feet. 112	7	3	27	37
2nd	11 months	24	2,062 $\frac{1}{2}$	233 $\frac{1}{2}$	1	1	22	24
3rd	10 months	34	1,250 $\frac{1}{2}$	140	1	1	32	34
4th	9 months	20	1,437 $\frac{1}{2}$	252	..	..	20	20
5th	8 months	18	2,240	476	1	1	16	18
6th	7 months	17	1,166 $\frac{1}{2}$	326 $\frac{1}{2}$	..	1	16	17
7th	6 months	5	1,306 $\frac{1}{2}$	298 $\frac{1}{2}$	..	..	5	5
8th	5 months	5	1,456	438 $\frac{1}{2}$	..	..	5	5
Total.. ..		160	....	....	10	7	143	160

It will be observed from the above, that there are only ten tanks properly built up, seven in an unfinished state, and the rest mere excavations. Very little water out of these tanks is used for purposes of irrigation ; in fact none of them could supply a sufficient quantity even to water a small patch of land. As a good deal of information is contained in the foregoing table, which has been drawn up with great care, I forbear to enter into any further particulars.

Wells.—Colaba, I would venture to say, is better supplied with wells than any other part of the Konkun of similar extent. The greatest number is in the cocoanut plantations, along the sea-shore, where they are very easily made, and with comparatively little expense. The salt batty lands (that is

nearly all the country eastward of the hills) are the worst off, some of the villages being about two miles away from the wells they draw water from ; and though some attempts were made by the Agent to lessen this evil, few succeeded, owing to the water in the large flats being exceedingly brackish. The following is a statement of all the wells in the Agency, showing the uses to which they are applied :—

Number of Wells used for Drinking purposes.	Number of Wells used for Irrigation.			Grand Total of Columns 1 and 4.
	Large.	Small.	Total.	
1,099	466	546	1,012	2,111

From the above it will be seen that there are about ten wells to every square mile in the district ; but these are not all of regular masonry—some of them are mere excavations ; but for all that, they serve the purposes of irrigation nearly as well as if they had been built up. No separate record has yet been kept of the number of built-up wells, but I should not estimate them to be more than 400.

Means of Irrigation in each District.—In the bagayut, the land is for about seven months solely irrigated from wells. The manner in which it is drawn up by means of the rhat or water-wheel has already been described in page 10. Vegetables or malwai crops are irrigated from wells, tanks, and rivulets : there is very little of this description of cultivation in the district. There is no other description of irrigation in the Agency. Rice and all other crops are cultivated during the rains.

PART VI.

CITIES, TOWNS, AND VILLAGES.

Cities.—There are none. Cheol was some centuries ago one of the largest cities on the coast, and there are many traditionary tales of its splendour before and during the time of the Mahomedans. The numerous ruins, and detached pieces of the ancient wall which it is supposed enclosed the city, confirm this in a great measure.

Towns.—There are only two places in the district which can be called towns, viz, Rewdunda and Alibagh, both situated on the sea-shore. The former is a long straggling place, running along the side of a creek near the sea, and is divided into two parts by an old wall, built by the Portuguese : it runs in a northerly direction, and, turning off in a bow from east to west, returns to the

ditch of the fort on the south,* thus enclosing a space of about three quarters of a mile in length, and about as much in breadth. Rewdunda proper is that portion of the town within the walls, and contains the houses of all the merchants, tradesmen, Brahmins, and a few of the Mussulmans and Kolees, &c. as also the Mamlutdar's office: the outer part is occupied by Kolees or fishermen, Mussulmans, Mahrattas, and Israelites. There are 1,470 houses (95 tiled and 1,375 thatched†), with a population of 6,260 souls, according to the census taken on the 1st January 1850, which shows the number of each caste as follows:—

	Males.	Females.	Total.
Hindoos	2,857	2,846	5,703
Mussulmans	156	137	293
Israelites	126	119	245
Native Christians	8	11	19
Total....	3,147	3,113	6,260

The following also shows the number of cattle, &c. enumerated on the same day as the above:—

Bullocks	615
Cows	460
Male buffaloes	95
Female buffaloes	270
Horses and mares	18
Asses	15
Sheep	25
Goats	70
Total....	1,568

One long line from north to south, inside the walls, serving the purposes of a road, divides the town. There are no made roads, although they are much needed, and might be constructed at a small expense.

The houses fronting the main thoroughfare are mostly tiled, and, generally speaking, are well built, and not altogether devoid of a comfortable appearance. There are in this town and the plantations belonging to it 2 tanks and 315 wells, and other excavations for water.

Rewdunda, though only a few-feet above the level of the sea, is healthy: the houses not being very closely packed together (as is too often the case), nearly every part is exposed to the beneficial influence of the sea breezes.

In point of size, Alibagh is next to Rewdunda, although there is not much difference. The site of the present town was originally covered by the sea: an old wall, the remains of which are still to be seen, was built by Govind Shet, a former Dewan, about the year 1770, to protect the old town. By the constant receding of the sea, so much land was thrown up, that the former

* The western wall, being on the edge of a little creek, has either been washed away, or destroyed by the inhabitants for building purposes.

† There is no record of the number of pueka and kutchra houses, but it may be safely stated that there are only a very few of the former in the Agency.

town of Ramnath was gradually deserted, and Alibagh rose in its stead. Alibagh is the only place in the district provided with roads, and these were laid down by the convicts since Colaba lapsed to Government. The roads have divided the town into regular compartments, and have given the place quite a different appearance from what it had before. Under the Native rule no attention was paid to the cleanliness of the place, and the thoroughfares were in an exceedingly bad state. The annexed is a map, (drawn up from an accurate survey made by me in 1849,)* showing the different roads, with their exact lengths, and the situation of the town in general, which, it will be observed, is nearly surrounded by the sea and creek.

The houses facing the roads are well built, and are mostly tiled : they have an air of comfort about them, which would be greatly increased were the Natives to learn the advantage of having much larger doors and windows.

There are 140 tiled and 1,087 thatched houses in this town, with a population of 4,329 souls, according to the census taken on the 1st January 1850. The following shows the number of the principal divisions of all the castes :—

	Males.	Females.	Total.
Hindoos.....	1,911	1,853	3,764
Mahomedans.....	192	193	385
Israelites	77	81	158
Christians (European).....	6	5	11
Do. (Native)	8	3	11
Total.....	2,194	2,135	4,329

The number of cattle, &c. in the town will be seen at one glance from the following table, which has been drawn up from the enumeration tables of the 1st January 1850 :—

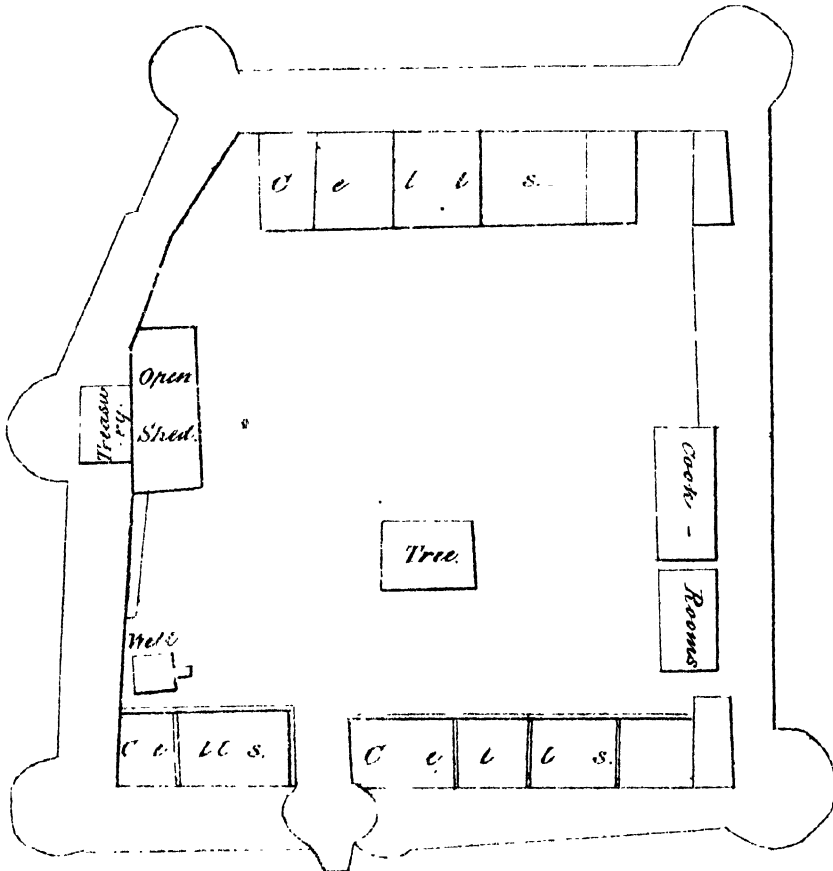
Bullocks	201
Cows	230
Male buffaloes	115
Female buffaloes.....	210
Horses and mares	80
Asses	15
Sheep	2
Goats	50
Total.....	903

The town is well off for water. There are 271 wells, and other excavations for water, and 1 tank. The wells are mostly situated in the cocoanut plantations. The water is a little brackish, but not considered unwholesome, and being found within a few feet of the surface, and the digging through the sandy soil being an easy matter, it is not surprising that so many wells have been dug to supply so small a population. Persons who can afford it get their drinking water from a delicious spring situated at the foot of a hill about three miles from the town. Alibagh being the head quarters of the Agency, is the only

* I have since put in all the roads constructed up to the 31st December 1850.

place in the district which has a few public buildings. The Agent's Court or Adawlut, situated about the centre of the town, was built about the year 1821-22, by the late Government, and has ever since that period been used as a hall of justice. The Native Court used to assemble in this building formerly on Sundays : the Surkheil nominally presided, but the real authority was in the Dewan's hands. This place has excellent accommodation for the Agent's Court, which is held below, and is capable of containing about two hundred people with ease. The Moonsiff holds his Court upstairs, which, like the upper stories of most Native houses, is little better than a garret. This building has anything but an imposing appearance. It is low, and has hardly any basement, but the roof is supported by strong wooden pillars, and good thick walls.

The largest building in use in Colaba is the Heerakote, a small fort to the west of the town, and within a few hundred yards of the sea. It is used as a jail, for which it is well adapted. The following is a ground-plan of it, which I made some time ago :—



On the battlements are the hospital, and a large room for prisoners sentenced to imprisonment without labour, as also a ward for female prisoners. The accommodation for the convicts is excellent, and the place is kept exceedingly clean. There are seldom more than 75 prisoners in it at a time, and by making a few more cells it might afford room with ease for 120. A strong room on the west is reserved as a treasury.

No new edifices have been erected since Colaba lapsed, no necessity for any having arisen.

Villages.—The principal villages in the district are Cheol, Nagaon, Akshee, Thul, and Kehim, in the bagayut; and Poenar and Rewus in the salt-batty lands to the east of the hills which divide Colaba.

Cheol, Nagaon and Akshee resemble one long straggling village, containing a population as follows:—

	Males.	Females.	Total.
Cheol	2,292	2,156	4,448
Nagaon.....	1,621	1,520	3,141
Akshee.....	704	655	1,359
Total....	4,617	4,331	8,948

The town of Rewdunda is also contiguous to Cheol.

The houses belonging to each of these divisions are scattered throughout a distance of about eight miles: each house being generally surrounded by a hedge, they are nearly invisible from the road, owing to the thickness of the plantations, and the luxuriant growth of underwood throughout. There are in this space 1,947 houses, as detailed below:—

	Tiled.	Thatched.	Total.
Cheol	5	971	976
Nagaon .....	..	633	633
Akshee	3	335	338
Total....	8	1,939	1,947

The chief householders are Brahmins, and the mass of the lower inhabitants consists of Bhundarees or toddy drawers, and Koonbees. A great many Kolees live in Akshee, a great fishing station; they have also a few houses in Nagaon. In some places on the road side may be seen a few goldsmiths' houses clustered together, with a temple and a tank in the centre, and a couple of Banians' shops, and a few Brahmins' houses. These places form a sort of centre for the village community to assemble together at on market days and holidays. The houses are commodious, and kept clean. It will be remembered that these villages are the principal in the bagayut, and supply the Bombay market with articles of vegetable produce.

Thul, three miles to the north of Alibagh, is also a long straggling plantation village, extending three miles from north to south, and much in appearance like Akshee. It has a population of 2,813 souls, with 591 thatched houses.

There are a great many Kolees or fishermen in this village, and the Brahmins are not so numerous in proportion to the other population as in Nagaon. The place is of importance : a passage-boat plies daily between it and Bombay ; and it is also a great fishing station.

Kehim is another plantation village to the north of Thul, and is much like Nagaon in every respect : it has 5 tiled and 200 thatched houses, with a population of 1,031 souls. Under the late Government a Soobheddar or district officer was stationed at this place.

The villages of Poenar and Rewus, situated in the salt batty lands, are very unlike those in the bagayut, the houses being clustered together on little mounds and other elevations. Poenar is the Mamlutdar's station, and is centrically situated in his talooka : it is about 11 miles from Alibagh, and has a population amounting to 507 souls, with 5 tiled and 138 thatched houses. A bazar is held here every Monday, to which people from all the surrounding districts resort, some with articles of merchandize and grain, and others for the purpose of making purchases. Water is scarce in this village, as well as in all others in the salt batty lands. On a market day the few wells about the village are thronged night and day.

Rewus is situated on the side of a creek, a branch of the Nagotna estuary, and lies on the north extremity of the district. Its importance may be said chiefly to depend upon the passage-boats which ply daily between it and Bombay. During the rains it is the resort of a great number of passengers, who come from the neighbouring districts of Tanna and Colaba, and yet there is no dhurumsalla or other public place for them to put up in for shelter from the inclement weather. This village had a small stone jetty, which has been neglected of late, and is being fast destroyed by the sea. The population amounts to 664 souls, of which a great number are fishermen, who live in the worst locality of the village, and in low, dirty, mean-looking huts. The cultivators' houses are better built, more cleanly kept, and are in much better situations. There is a scarcity of water in this village, which is a great drawback, and is much felt by travellers who put up there on their way to Bombay. This might be easily remedied by the making of a few wells, which I believe is quite feasible. There are 147 thatched houses in Rewus.

The situation of all the other villages throughout the district varies according to local circumstances. In the salt batty lands they are situated on slight elevations, raised a little above the surrounding swamps. A little further inland, towards the hills, the villages are scattered here and there, without any apparent design with regard to particular localities : sometimes a rivulet or other place for water would appear to have influenced the original settlers in their selection. In the bagayut, as remarked before, the houses are scattered throughout the plantations.

There are altogether 160 inhabited towns and villages in the Agency, as per

subjoined table, which also shows the population and revenue of each, according to the most accurate returns in the Agent's Office.*

* The whole number of thatched and tiled houses and huts, &c. in Colaba is as follows :—

Thatched	13,105
Tiled	269
	<hr/>
Total.....	13,374

By dividing the total of the population by the number of houses, the result is 4,276 individuals to one house.

* Vide statement of Patels' huts, forwarded to the Revenue Commissioner with the Agent's letter dated 31st July 1849, No. 512.

Table showing the Number of Inhabited Towns and Villages in the Agency, with the Revenue and Population of each.

NAMES OF VILLAGES AND HAMLETS (in Marhatta and English).					Amount of Jumabun- dee of each Village, being the Average for the 6 Years ending 1847-48.	Population of each Village on the 1st January 1849.
नांव.	गाढे.	Villages.	Hamlets.	Rs. a. p.		
1 झाणे चेउल ... ..	.....	Thana C	There are 16 divisions in this village, called Pakhadees.. ..	10,476 1 4	4,409
2 झाणे नागांव	बासगळा	Thana	Bagmulla	5,535 15 4	3,164	
3 झाणे बळ	कोयटगाढ	Thana T	Kothurbhat	5,500 12 0	2,835	
4 बार भासापुर	{ बरिरीपाडा डोळपाडा बासगपाडा }	Khar Shahi	{ Buheereepada Dholepada Dhamunpada }	5,231 15 11	1,117	
5 पेठ रेवदेडा	{ बरवेळी खंडेरावपाडा.. मोसपाडील कोरजीपाडा.. आमळाबाची वाडी .. अमरपालव }	Petit Rewdund.	{ Wursolee Khunderow- pada Gome Patel Joreneepada Agulawyachee Wadee .. Agurpalow }	3,662 4 1	6,300	
6 सासाळ खावास	{ सुवर देवाळी सापौळी }	Mahal Awas	{ Mooghur Taikalee.. .. Mhatrolee }	3,364 1 2	813	
7 झाणे सारळ	{ कसळ पाटिल दाद पाटिल चोकीचा पाडा }	Monjei Sarul	{ Kumul Pateel Dad Pateel Chowkeecha Pada.. .. }	3,108 4 10	759	
8 बार भासावाज	{ दाद पाटिल चोकीचा पाडा }	Khar Shahbaj	{ Dad Pateel Chowkeecha Pada.. .. }	2,497 1 3	767	
9 बार बरवेळी	{ बरवेळी सापौळी }	Khar Hashweera..	{ Seerowlee Seerowlee }	2,463 4 11	844	

10	कंसके शिराड	...	...	...	...	...	Kusba Jheerad..	...	Taikale	...	2,363	9	8	410
									Murratyacha Pada..	...				
11	सोने पोखण्डे	...	...	...	...	...	Moujey Dhokawdai..	...	Bhagpada	...	2,349	4	0	520
									Mandwai	...				
12	खार सागकुले	...	...	...	...	...	Khar Mankoolai..	...	Padawurchaaguree	...				
13	सोने रेश्वर	...	...	...	...	...	Moujey Deoghur..	...	Buheeracha Pada ..	...	2,140	5	0	453
14	सोने सारुग	...	...	...	...	...	Moujey Sahar ..	...	Bagh Surace ..	...	2,108	11	3	130
15	गाने वरसोडी...	...	...	...	...	...	Thana Wursolee ..	...	Gotee ..	...	1,974	9	10	190
									.....	...	1,957	9	8	1,744
16	सोने वरडे...	...	...	...	...	...	Moujey Wurrundai..	...	Wurrundiyacha Pada	...	1,879	14	6	123
									Deoghuralugutcha	...				
17	सोने काविर	...	...	...	...	...	Moujey Kaweer ..	...	Guroodpada ..	...	1,856	13	10	408
									Borepada ..	...			
18	सोने पावरें	...	...	...	...	...	Moujey Ct ..	...	Khareekpada	...				
19	सोने शिचोडी...	...	...	...	...	...	Moujey C ..	...	Yeshwuntkhar	...	1,839	2	7	676
									.....	...	1,759	5	5	325
20	कसने मरपुर	...	...	...	...	...	Kusba F	...	Pada Purhoor	...	1,728	1	5	486
									Jhalkhund	...				
21	सोने कुवर	...	...	...	...	...	Moujey	...	Pada Dhowur.	...	1,621	5	0	195
									Weerwadee	...				
22	सोने कामारले	...	...	...	...	...	Moujey Kamarlai	...	Buheerumpada	...	1,578	6	9	827
									Sootarpada ..	...			
									Soneghur	...				
									Waghola Gowlyachee..	...				
23	पेट श्रीवाज	...	...	...	...	...	Peit Shreebagh ..	...	Nuvaidhur Chaidhrarai	...	1,571	8	6	4,347
									Ramnath ..	...			
24	कसने बाळगमांस	...	...	...	...	...	Kusba Bamhungson	...	Pooteebacecha Pada ..	...	1,557	10	0	177
										...				
										Carried over...	70,426	2	3	32,019

NAMES OF VILLAGES AND HAMLETS (in Marhatta and English).					Amount of Jumabun- dee of each Village, being the Average for the 6 Years ending 1847-48.		Population of each Village on the 1st January 1849.	
सं.व.	पाडे.	Villages.	Hamlets.		Rs.	a. p.		
25	सोने अगरपुरे	देकोली सांवाचा पाडा, कोळी ... मुळगांवानजिकपाडाकोळी पाडा जातमाळी ...	Moujey Agursoorai ...	Brought over.... Taikalee Nandiacha Pada, Kolee Moolgaonujeekpada, Ko- lee Pada Jatmalee	70,426	2 3	32,019	
26	साव्हाल किरीम	हामस	Mahal Kehim	Kamuth..	1,487	2 8	1,028	
27	सोने रमवी	.....	Moujey Yeshwee..	.....	1,479	8 1	1,62	
28	सोने पाझर	.....	Moujey Pajhur ..	.....	1,437	14 8	...	
29	सोने चिंचवली	साधववाडी	Moujey Chincholee	Madhowvadee	* 1,435	0 11	326	
30	सोने रामराज	राजवाडी	Moujey Ramraj ..	Rajvadee	1,416	14 0	501	
31	खार नारंगी	पाडा नारंगी पाडा रंजणखार	Khar Narungee ..	Pada Narungee Pada Rajunkhar..	+ 1,401	3 0	281	
32	सोने मुणे	पाडा माळीकोकाचा	Moujey Koonai ..	Pada, Maleelokacha	1,375	15 5	149	
33	सोने बेकोशी	पाडा बेकोशी	Moujey Belosee ..	Pada Belosee..	1,369	11 2	470	
34	सोने पोयगाड	नवेनगर	Moujey Peenar ..	Nuvainuggur..	1,356	6 10	492	
35	सोने सोमांव	कोरोडे	Moujey Sagon ..	Chorondai	+ 1,342	4 9	245	
36	सोने कारले	.....	Moujey Karlai ..	.....	1,329	1 2	264	
37	सोने मापगांव	.....	Moujey Mapgaon..	.....	1,323	9 11	300	
38	सोने बिडवाळे	.....	Moujey Beedwaglai	.....	1,321	10 7	218	
39	सोने सखान	पाडा घुम	Moujey Mullan ..	Pad Ghoom..	1,297	0 10	246	
40	सोने कुसुपळे	.....	Moujey Koosoomblai	.....	1,267	2 2	195	

NAMES OF VILLAGES AND HAMLETS (in Marhatta and English).					Amount of Jumabundee of each Village, being the Average for the 6 Years ending 1847-1848.		Population of each Village on the 1st January 1840.	
मां.व.	पाडे.	Villages.	Hamlets.		Rs.	a. p.		
63 सोजे कुबळ	अंबिपाडा	Moujey Koorool	Brought over..		1,15,900	3 4	42,876	
64 सोजे कुकुडी कोसडेभी .. .. .	.....	Moujey Koorkoondē Kō- letaimbee.	Ambaipada		917	12 11	238	
65 खार घेरंड .. .. .	.....	Khar Dhairund .. .. .	.....		† 912	2 7	..	
66 सोजे तळवडे	जळपाडा	Moujey Tulowdai .. .. .	.....		900	5 3	136	
67 ठाणे आक्षी	जळपाडा	Moujey Tallowdai	Julpada.. .. .		876	7 5	141	
68 खार राजणखार	जळपाडा	Thana Akshee	Jambulpada.. .. .		861	11 6	1,370	
69 खार सोनकोठा	रायवाडी	Khar Ranjankhar	Raewadee		824	11 6	294	
70 सोजे वडव बुद्रक	साखर	Khar Sonekotha	Sakur		796	13 8	..	
71 सोजे कुदे .. .. .	.....	Moujey Wudhow (Boo- drook).	.....		791	2 2	225	
72 खार देहेनकोनी .. .. .	.....	Moujey Koodai .. .. .	.....		775	9 5	175	
73 सोजे वेखवडी .. .. .	.....	Khar Dehenkonce .. .. .	.....		775	9 3	104	
74 सोजे सुरई .. .. .	.....	Moujey Belolee .. .. .	.....		749	5 1	44	
75 खार काचळी .. .. .	.....	Moujey Soorace .. .. .	.....		748	0 5	..	
76 सोजे आंबेपुर	बांधण	Khar Kachlee .. .. .	.....		738	14 0	194	
77 खार मेडेखार .. .. .	.....	Moujey Ambapoor	Bandhun.. .. .		736	14 6	315	
78 सोजे साहानबा	पाडा साहानबा	Khar Meidhakhar .. .. .	.....		731	11 8	234	
		Moujey Mahan	Pada Mahancha		724	14 10	436	

79	मैजे तळवली उमदे ..	{ नवखार ..	{ Moujey Tullowlee ..	{ Nowkhar ..	723 11 7	169
80	खार सांबरी ..	{ भागावबाडी ..	{ Khar Sambree ..	{ Bhagowadee ..	707 2 2	..
81	मैजे मान ..	सुतवे ..	Moujey Maun ..	Bhootwai ..	701 15 5	174
82	मैजे आवेडी ..	पाडा आवेडी ..	..	Pada Awaitee ..	676 15 0	450
83	मैजे सागांव ..	पाडा सागांव ..	..	Pada Sagow ..	672 0 5	132
84	खार काळवड ..	..	Moujey Sagow ..	..	663 9 10	..
85	मैजे बहिराळे ..	..	Moujey Buheeralai ..	..	660 5 11	282
86	खार खोपणे ..	..	Khar Khopunai ..	..	644 2 9	97
87	खार बाघण ..	..	Khar Waghun ..	..	629 3 10	182
88	मैजे पाखे ..	..	Moujey Palhai ..	..	628 12 6	..
89	मैजे यळे ..	..	Moujey Moolai ..	..	619 11 10	78
90	मैजे कोणधरे ..	..	Moujey Loneharai ..	..	610 0 10	42
91	खार नवखार श्रीगांव ..	..	Khar Nowkhar (Shree-gaon).	..	601 4 7	195
92	मैजे वळवली ..	..	Moujey Wulowlee ..	Pada Mutt ..	+ 588 5 8	143
93	मैजे तळवली खंडाळे ..	..	Moujey Tullowlee (Khundalai).	..	573 4 6	95
94	मैजे नेदुली ..	..	Moujey Naihoollee ..	Pada Naihoollee ..	559 1 2	110
95	खार भिलजी ..	..	Khar Bhiljee ..	..	558 10 5	..
96	मैजे दापोली ..	..	Moujey Dapolee ..	Kopree ..	552 13 1	102
97	मैजे माडवागळे ..	..	Moujey Tadwaglai ..	Katawadee ..	549 1 7	138
98	मैजे बाक्कणडरे ..	..	Moujey Bamhunsorai ..	Vittobacha Pada ..	548 14 2	161
99	खार फणसापुर ..	..	Khar Phunsapoor ..	..	539 8 6	..
100	मैजे पोवेळे ..	..	Moujey Powulai ..	..	537 3 6	103
101	मैजे पेढावे ..	{ केतकीचा मळा ..	{ Moujey Pedhambai ..	{ Ketkecha Mulla ..	* 535 0 7	114
		{ राजमळा ..	{ ..	{ Rajmulla ..		
		{ सुसबसादनपाडा ..	{ ..	{ Moosulmanpada ..		
Carried over..					1,42,843 5 4	49,549

NAMES OF VILLAGES AND HAMLETS (in Marhatta and English).

क्र.सं.	पाडे.	Villages.	Hamlets.	Amount of Jumabun- dee of each Village, being the Average for the 6 Years ending 1847-1848.		Population of each Village on the 1st January 1849.
				Rs.	a. p.	
102.	सोने वेळवली	Moujey Welhowlee	Brought over..	1,42,843	5 4	49,549
103	खार चव्ही	Khar Churhee	.....	533	8 1	75
104	सोने बागणाली	Moujey Bamnolee..	.....	522	5 3	483
105	खार पिठकरी	Khar Peetkeeree..	.....	520	12 9	84
106	खार फोफरी	Khar Phopharee..	.....	515	12 7	234
107	सोने मांदे	Moujey Mandai..	.....	495	4 7	144
108	सोने डावाले	Moujey Dawalai..	.....	475	7 5	..
109	सोने सादाने	Moujey Bhadanai..	.....	471	8 11	..
110	सोने कावाडे	Moujey Kawadai..	Belpada..	464	14 3	37
111	सोने सुवेत	Moujey Mooshet..	.....	453	11 10	112
112	खार तामपुर	Khar Tajpoor..	Kolewada ..	440	12 0	115
113	खार बागविरा	Khar Wagveera..	.....	432	0 6	174
114	सोने नामझरी	Moujey Nagjhuree	Dhaktee Nagjhuree	427	12 8	171
115	सोने मुजिस	Moujey Goonjees..	.....	420	8 3	28
116	सोने वावे	Moujey Wawai..	.....	419	0 10	42
117	खार नवखार उमडे.	Khar Nowkhar (Oomtai)	.....	407	6 4	124
118	सोने उषर	Moujey Oosur..	.....	395	1 2	173
119	सोने तुडाळ	Moujey Toodal..	.....	392	11 10	66
120	सोने रावेत	Moujey Kawait..	.....	390	5 7	..
121	खार मिळकत...	Khar Milkut..	Bag Dandai..	385	10 0	197
122	खार पेडावे	Khar Pedhambai..	.....	385	2 1	200
123	सोने कोपरोली	Moujey Koperolee	.....	* 383	7 1	145
124	सोने आंबेवर...	Moujey Ambaghur	.....	369	3 0	78
			.....	† 355	10 6	76

NAMES OF VILLAGES AND HAMLETS (in Marhatta and English).				Amount of Jumabun- dee of each Village, being the Average for the 6 Years ending 1847-1848.	Population of each Village on the 1st January 1849.
गं.व.	पाडे.	Villages.	Hamlets.	Rs. a. p.	
150	खार बेल्खार	Khar Belkhar	Brought over ..	1,60,080 10 10	54,356
151	खार वातघर	Khar Satghur .. ..	.....	210 2 10	..
152	मौजे भोगम	Moujey Bhonung .. ..	.....	205 2 3	45
153	मजरे रेवस	Muzrai Rewus .. ..	.....	204 2 2	92
154	मौजे कोळघर	Moujey Koleghur .. ..	.....	190 8 0	660
155	खार जळसी	Khar Julsee .. ..	.....	+ 179 12 8	118
156	मौजे मांडवे (बावणगांव) ..	Moujey Mandwai (Bam- hugaon).	.....	171 7 4	..
157	खार जेमी	Khar Laibhee .. ..	.....	171 2 1	..
158	खार खिडकी	Khar Kheedkee .. ..	.....	163 15 4	28
159	मौजे बळे	Moujey Roolai .. ..	.....	163 11 0	87
160	खार सरेंखार	Khar Soorakhar .. ..	.....	161 3 0	48
161	मजरे वायगेत	Muzrai Waeshaith .. ..	.....	151 4 0	..
162	खार वासखार	Khar Washkhar .. ..	.....	149 11 5	62
163	मौजे खरोसीभोड	Moujey Khuroseebhond ..	.....	149 10 5	109
164	खार मोरखोस	Khar Morekhole .. ..	.....	137 3 2	..
165	वेराकिले सागरसड	Gherakila Sagurgur	Pada Chutreeamba ..	131 10 2	..
166	खार रायदे	Khar Randai .. ..	.....	123 2 9	74
167	खार घसवड	Khar Ghuswad .. ..	.....	122 8 1	..
168	खार साकरवड	Khar Bhakurwad .. ..	.....	116 9 8	54
169	खार मुगाड	Khar Dhoowad .. ..	.....	115 14 0	52
				112 3 8	..

170	खार नवखार रायदे ..	.....	Khar Nowkhar Raindai	.....	110 5 5	..
171	खार दिविपारंगी ..	.....	Khar Deeweparungee..	.....	110 0 2	102
172	मौजे रागवली ..	.....	Moujey Wunnowlee ..	.....	+ 107 12 4	38
173	खार मळाणी ..	.....	Khar Tullanee ..	.....	103 14 1	..
174	मौजे मोठेवर ..	.....	Moujey Gotaighur ..	.....	102 10 9	28
175	खार रामकोठा ..	.....	Khar Ramkotha ..	.....	89 14 9	..
176	खार मोळीकोठा ..	.....	Khar Gowlackotha ..	.....	86 0 9	..
177	मौजे मोठी ..	.....	Moujey Gotee ..	.....	85 13 6	60
178	खार गवखार ..	.....	Khar Gowkhar ..	.....	72 9 0	..
179	मजरे देवतळई ..	.....	Muzrai Deotullae ..	.....	70 3 10	..
180	मौजे निगडे ..	.....	Moujey Neegdai ..	.....	64 15 11	5
181	खार भोडखार ..	.....	Khar Dhondkhar..	.....	62 8 5	96
182	खार करंजविहा ..	.....	Khar Kurrunjweera ..	.....	57 14 4	64
183	मजरे नवेदर बेळी ..	पाडा दिवराई ..	Muzrai Nuvidur Bailee.	Pada Devairae ..	57 7 11	185
184	खार दिवलांग ..	.....	Khar Dewlong ..	.....	54 4 1	..
185	मजरे बईशेत भोमवली ..	.....	Muzrai Rooeshaith Bho- mowlee	.....	42 13 10	92
186	खार लोणकोठा ..	.....	Khar Lonekotha ..	.....	40 0 11	..
187	मौजे माण (परदुर) ..	.....	Moujey Gaun (Purhoor).	.....	39 9 10	..
188	मौजे वेळत ..	.....	Moujey Velut ..	.....	39 6 6	8
189	खार राजणखार डावली ..	.....	Khar Rajunkhar Dowlee	.....	38 12 0	80
190	मौजे माण (मोमांब) ..	.....	Moujey Gaun (Shree- gaon).	.....	38 6 10	..
191	खार जुरंगोली ..	.....	Khar Joeeegowlee ..	.....	38 4 7	..
192	खार विमादेवी ..	.....	Khar Seema Daiwee ..	.....	35 14 11	..
193	मजरे विर्नसारळ ..	.....	Muzrai Veertsarul ..	.....	35 3 8	66
194	मजरे दुर्गंदया ..	.....	Muzrai Doorg Duria ..	.....	33 1 5	..
Carried over ..					1,64,796 11 6	56,609

NAMES OF VILLAGES AND HAMLETS (in Marhatta and English).				Amount of Jumabundee of each Village, being the Average for the 6 Years ending 1847-1848.		Population of each Village on the 1st January 1849.	
नां.व.	पाडे.	Villages.	Hamlets.	Rs. a. p.			
195	खार लक्ष्मीप्रसाद ..	Khar Luxmee Prusad ..	Brought over..	1,64,796	11 6	56,609	
196	खार गुरू बापुजी ..	Khar Jootee Bapoojee ..	.....	32	7 1	..	
197	मौजे खरोसी दळवी ..	Moujey Khurosee Dulvee ..	.....	32	4 7	..	
198	मौजे काळोसी ..	Moujey Kalosee ..	.....	31	7 3	..	
199	नवेदर कोळगांव ..	Nuvaidur Kolegaon ..	.....	27	12 5	..	
200	खार मोढविह्रा ..	Khar Modeweerha ..	.....	23	4 5	..	
201	खार ताडाचा कोठा ..	Khar Tadacha Kofa ..	.....	22	3 3	..	
202	खार चिवरेच ..	Khar Sewsundh ..	.....	12	0 4	..	
203	खार संगारदादाजी ..	Khar Bhungardadajee ..	.....	8	9 9	..	
204	मौजे बोपेळी ..	Moujey Bapolee ..	.....	8	4 9	..	
				4	11 0	..	
				1,65,032	13 9	56,609	
				Government Revenue...	2 9		
				Alienations ...	5,668 11 0		
				Total..	1,65,032 13 9		

* Half alienated villages.

† Villages altogether alienated in inam.

PART VII.

POPULATION, EMPLOYMENT, AND LANGUAGES.

Population.—The population is made up chiefly of Hindoos; the Mahomedans, Israelites and others not forming one-twentieth of the whole. The generality of Natives are under the impression that the population has been gradually on the decrease since the lapse of Colaba to the British Government; but this opinion appears to be altogether without foundation, for on a reference to Colonel Jervis' "Statistics of the Western Coast of India," I find that he estimated the population of Angria's Colaba in 1825—1830 to amount to 28,489 souls, and this with Peta Sae,* which no longer belongs to it, but forms an integral part of the Tanna zillah. But allowing that this estimate was fixed at too low a figure, which it does appear to have been, it is unlikely that a population like that of Colaba, composed chiefly of a poor agricultural class, should have more than doubled itself in the course of about twenty years.

The following is a comparative table of the principal divisions of the several castes for the five years ending 1st January 1850, compiled from the detailed tables in the Agent's Office :—

* The population of Sae in 1830 might be estimated to have amounted at the very least to 4,000, leaving a remainder to Colaba of only 24,489.

General Comparative View of Castes for the Five Years from 1846 to 1850.

	HINDOOS.										PAR-SEES.		MAHOVEDANS.		ISRAELITES.		NATIVE CHRISTIANS.		EUROPEANS.		GRAND TOTAL.												
	Hindoos of the higher Castes.			Wild Tribes.			Low Castes.				Males.	Females.	Total.	Males.	Females.	Total.	Males.	Females.	Total.	Males.	Females.	Total.											
	Males.	Females.	Total.	Males.	Females.	Total.	Males.	Females.	Total.	Males.													Females.	Total.	Males.	Females.	Total.	Males.	Females.	Total.	Males.	Females.	Total.
1st Jan. 1846..	25,435	23,608	49,043	157	159	316	876	739	1,665	5	2	7	789	739	1,528	417	445	862	14	6	20	5	7	12	27,698	25,755	53,453						
1st Jan. 1847..	25,559	23,818	49,377	117	118	235	905	817	1,722	2	2	4	779	724	1,503	421	455	876	6	2	8	5	5	10	27,794	25,939	53,733						
1st Jan. 1848..	26,504	24,632	51,136	157	150	307	934	844	1,778	2	2	4	806	742	1,548	416	452	868	13	11	24	4	5	9	28,836	26,836	55,672						
1st Jan. 1849..	26,878	25,159	51,837	198	205	403	925	840	1,765	6	7	13	797	731	1,528	498	477	975	15	14	29	4	5	9	29,121	27,488	56,609						
1st Jan. 1850..	26,981	25,477	52,458	172	201	373	940	824	1,764	6	8	14	799	793	1,592	477	469	946	18	14	32	5	6	11	29,398	27,792	57,190						

The conclusion which would be come to from a superficial view of the last column of the foregoing table would be to a certain degree favourable to Colonel Jervis' estimate, as it would appear that the increase during the four years is 6.991 per cent.; but the censuses taken previous to the 1st January 1850 cannot be so trustworthy as the one for that year, both owing to greater accuracy in the enumeration having been enforced of late, and to the fact of the enumerators having adopted an improved system for ascertaining the number; besides which, the people have a better understanding of the object of these inquiries, and are not, therefore, likely to give a false account, from any groundless fear of an imposition of some new tax. However, there is sufficient proof to show that the population has not been on the decrease, but, on the contrary, most certainly on the increase; and the only way to account for the incorrect notions the Natives themselves have formed of this subject is, that under the late State there was a greater number of retainers and other people in Government employ, most of whom left the district on the lapse; and this mere fractional reduction they suppose has had the effect of decreasing the population to such a material degree that it has not within the course of the last ten years regained its original standard.*

Number of Villages in the Agency.

Government.....	194½
Alienated	9½

Total..... 204

Population.

HINDOOS :						Males.	Females.	Total.
Brahmins	..	..	..	..	..	2,065	1,813	3,908
Shenwis or Senoys..	..	..	..	..	..	133	127	260
Purbhoos or Purvoos	..	..	..	..	..	412	369	781
Wanees or Banians	..	..	..	..	..	482	440	922
Sonars or Goldsmiths	..	..	..	..	..	444	406	850
Lohars or Blacksmiths	..	..	..	..	..	122	136	258
Kansars or Braziers	..	..	..	..	..	150	155	305
Tambuts or Coppersmiths	..	..	..	..	..	35	39	74
Sootars or Carpenters	..	..	..	..	..	83	75	158
Koombhars or Potters	..	..	..	..	..	169	180	349
Shimpees or Tailors	..	..	..	..	..	143	142	285
Nahvees or Barbers	..	..	..	..	..	177	169	346
Pureets or Washermen	..	..	..	..	..	93	83	176
Kolees or Fishermen	..	..	..	..	..	3,837	3,667	7,504
Telees or Oilmen	..	..	..	..	..	31	27	58
Bhocees or Hamals	..	..	..	..	..	68	55	123

* In the course of my arguments with a number of people, this has often been urged, even by very intelligent Natives, as a cause of this imaginary decrease.

	Males.	Females.	Total.
Dhungurs or Graziers of Sheep	98	85	183
Koonbees, Ryots or Cultivators	10,667	10,128	20,795
Rajpoots	7	7	14
Gowlees or Milkmen, and Graziers	238	231	469
Gowndees or Bricklayers	9	15	24
Bhundarees or Toddy drawers	2,248	2,258	4,506
Khutrees, Koshteas, or Salees, or Joolaces, Silk Weavers or Spinners	35	32	67
Rungarees or Dyers .. .. .	..	..	..
Booroods or Basket-makers	147	130	277
Putwegurs or Silk Fringe and Tassel Makers .. .. .	..	..	..
Other Castes	4,948	4,615	9,563
Kolees (wild tribe)	1	..	1
Bheels .. .. .	..	..	..
Katodees or Kathkurees	171	201	372
Ramoosees, or Bedurs or Katuks .. .. .	..	..	..
Chumbhars or Shoemakers, and Curriers	386	336	722
Mhars	520	459	979
Mangs	34	29	63
Shrawuks or Jains	82	10	92
Gooroos	19	17	36
Jungum Lingayuts	39	36	75
<hr/>			
Grand Total of Hindoos of all denominations	28,093	26,502	54,595
MAHOMEDANS, including Seedees	799	793	1,592
PARSEES.. .. .	6	8	14
ISRAELITES	477	469	946
CHRISTIANS, Europeans and Natives	23	20	43
<hr/>			
Grand Total of Population	29,398	27,792	57,190

In the above is given in detail the population return drawn up on the 1st January 1850, the accuracy of which I think may be relied upon.

The population is in the proportion of 271 souls to the square mile, and this, I would venture to say, is higher than any other piece of territory of similar size in the Tanna zillah; and is one of the reasons why it was found necessary to divide this small State into two third class talookas, both of which put together are not equal in extent to a fourth class talooka of the Tanna Collectorate.

Description, Employment, and Condition.—The several employments of the population are given in the above table, the denomination of each caste denoting its occupation and trade. It now only remains for me to enter into the particulars of the castes which form the bulk of the population, and those who have not hitherto been well known, the peculiarities of whose customs and manners entitle them to some notice.

The *Koonbees* (or agricultural class) are the most numerous, and form nearly half of the population of the district: they are divided into two bodies, called *Agrees** and *Mahrattas*; the latter are again sub-divided under two heads, viz. pure *Mahrattas* and *Akurmashees*, i. e. descendants of slaves or kept women. According to the census taken on the 1st January 1849,† the number of *Agrees* amounted to 16,792. They are the cultivators of the *kharapat* or salt batty lands, and are the lowest of the *Koonbee* caste. They often have two or three wives each, for the purpose of assisting in cultivation. The *Mahrattas* and *Akurmashees* never intermarry or eat with them. The *Agrees* have liquor shops, and sell liquor, which the *Mahrattas* will not do. There are, however, exceptions to this. The *Koonbees* are a hard-working agricultural class during the cultivating and harvest seasons, but after all the work connected with their fields is over they literally do nothing, when they might be engaged in improving their fields, or forming large parties for the purpose of making embankments, to prevent the immense quantity of fresh water during the monsoon losing itself in the sea. But it must be said that the labour in repairing embankments in the *kharapat*, and cultivating of the sweet rice lands in transplanting, &c. is extreme, and it is wonderful how the human frame can sustain such great vicissitudes as the *Koonbees* experience, while labouring under an alternate burning sun and heavy rain, and yet they are, generally speaking, healthy, and free from a great many diseases that the other classes of Natives are subject to. I frequently asked, but never heard a cultivator complain of the heat; and although it is wonderful that they are not often struck down by *coup-de-soleil*,‡ no cases of this kind have ever been known to occur.

In speaking of the condition of the *Koonbees*, we must take a brief review of what it was before the lapse of the State. During the late Government, (as has been already shown under the head of "Modes and Rates of Assessment,") each ryot paid in the shape of petty cesses (some quite absurd in amount, and others exceedingly irksome and vexatious, for instance vet bigar,§ &c.) about one-sixth more than is now collected; and besides this, people proceeding on Government service were always gratuitously entertained at the expense of the ryots, and hire for conveyance of baggage was a thing unknown. Yet, although the agricultural classes laboured under all these difficulties, and many more which have not been detailed, they appeared to be in rather a more thriving state than they are now.

* The *Agrees* are supposed by Captain Jervis to be one of the aboriginal tribes of India.

† Letter to Revenue Commissioner of 13th April 1849, No. 230.

‡ The position in which the ryots work in their rice fields is very distressing: they stand up to their knees in mud and water, in a stooping posture, with the back part of their heads often exposed to the powerful rays of the sun for hours together.

§ Compulsory labour at the rate of one day per month, or twelve times in the year, commuted for Rs. 1-8-0, from which 12 annas is deducted for subsistence.

This is strange, and more particularly so when we come to consider that in all transactions with the ryots the British Government has acted with far more liberality towards them than the Native Government would have done. This, with the discontinuance of the *sunchnee muktas*,* which has made the tenure of land far more certain, should have operated greatly for the improvement of the people, which it apparently has not done. To trace the cause of this retrogression is difficult, and I shall only be able to say a very little regarding it. First and foremost, it would, perhaps, be as well to give the opinion of the Natives themselves on this important subject. Their continual argument is, that all the surplus revenue is sent out of the country, which, they say with some truth, was formerly expended within the district, and therefore there was a constant circulation kept up; that there were a number of people entertained to perform certain duties which became obsolete since the lapse, and were consequently abolished; that all country products were consumed in the district, and were eagerly sought for—now the surplus is exported at a low rate, or sold to greedy Soucars, at a great sacrifice. Our civil courts, they say, have thrown more power into the hands of the money-lending classes than they had before the lapse; and from the easy, systematic, and prompt method of disposing of civil cases, the Soucars go to law for the most trivial matters, and have it in their power to ruin, by bringing their actions at a moment when they know that their debtors are not ready to meet their demands: decision is given; if in favour of the creditor, he sues out immediate execution, when the ryot's house, grain, and everything else is sold, leaving him his implements of husbandry, and cattle for the plough if he has any; whereas under the late Government the creditor was left in the generality of cases to compound with his debtor, and to get as much as he could out of him by constant dunning, &c.

But on the other hand, it is easy to trace that the agricultural class has for a long time back been in a state of retrogression, and, without doubt, they were received in this state from the late Government; and further, it is not to be supposed that this has been going on at more rapid strides since the lapse of the State. No new system has been introduced in the revenue department which has not always been exceedingly more liberal than the one it superseded: means for the transport of goods have been extended;† travelling has been rendered safer by our improved system of police; wells and tanks are made every year, and every encouragement is given to extend and improve agriculture; vexatious taxes have been abolished, and many other boons too great in number to detail have been conferred on the people; and surely all this should have had a good tendency, and is as much as

* Periodical surveys. See under the head of "Tenure and Occupation," at page 13, for an account of these oppressive surveys.

† The reduction in the passage-boat fares is here alluded to. Colaba is not well off for roads, although they might be made with little expense.

the most enlightened Government could be expected to have done for the country in so short a space of time.

The increasing poverty of the ryots is without doubt chargeable upon themselves: they have been from time immemorial an improvident race, running upon every little occasion to the money-lender for large sums, careless of what the consequences may be, or what misery is likely to be entailed on the succeeding generation; and all, perhaps, merely to gratify some foolish vanity, on the occasion of a marriage or a feast.*

The crime of drunkenness it is evident is on the increase, and the great number of liquor shops confirm this. How often are people to be seen returning from bazars in a state of intoxication? The demon drink is now making more victims in this land than all the plagues put together: it follows, then, as a matter of course, that the Koonbee's moral character is becoming debased, and his strength is being sapped imperceptibly. The question is, how are all these failings to be remedied? This is difficult of solution, and has, no doubt, often puzzled the heads of many wise legislators; because it must be remembered that we have to deal with a people averse to change for their improvement;—their great ignorance, prejudices, and superstitions are great bars to this; innovations they are enemies to; and therefore, if any reform is to be effected, it must be commenced in a cautious manner. The grand pivot upon which all reformati^ons should turn should be the confidence of the people in those who undertake the task of regenerating them. But this is not to be procured, unless the people are in the first instance made to abandon their superstitions and prejudices by the diffusive light of education: the masses must be rescued from their dark ignorance before any lasting benefit can be expected. But then an important question suggests itself: How are all the people to be educated?—and from it another emanates equally as important: Who is to undertake the work;—should the masses be left entirely to themselves in this respect, or should they look to Government for the boon? The only mode that appears at all feasible is that both parties should meet half way: the Government should commence the work, and the people be left to finish it.

The increasing evil of drunkenness must also be checked,—liquor must be kept out of the way of the people before anything can be done in the way of education;† and this does not appear to be a very difficult matter—the legislature might effect it with little trouble, and without risk ‡

* According to the Hindoo law, sons are held liable for the debts of their fathers, although they may have been incurred long previous to the birth of the former. They are also supposed to defray the debts of their ancestors, even should they not have inherited anything from them.

† On many occasions, when the bane of drinking has been pointed out to a Koonbee, the invariable answer has been "Keep liquor out of our way, and we will not seek for it: of course, when it is to be had in every large village at a cheap rate, we cannot resist the temptation."

‡ It is gratifying to know that Government has already taken up this subject.

In point of number the *Kolees* or fishermen come next under observation. Their locality is confined solely to the sea coast between Rewdunda and Rewus, and their houses are chiefly situated on the outskirts of all these plantation villages. Their principal occupation is catching and drying fish for home consumption and exportation: a great deal is also taken in fresh to Bombay direct from the stakes of Wursolee, Thul, Mandwa, and Rewus. Hooks and lines are hardly ever used. In fact, the system of stake-net fishing is the chief one that may be said to obtain along this coast, and a short account of it may be found interesting. Nearly every one of the banks out at sea within twelve miles of the land is covered with these stakes, which are sometimes made of the trunk of the cocoanut or palmyra palm, but generally of some sort of jungle wood: they average between 40 and 100 feet in length, and are towed out to sea by two or three boats. The lower end of the stake has a hole in it, through which a rope is drawn, and the ends are fastened to boats, which anchor off at a distance: the upper end of the stake is then drawn up out of the water in a perpendicular position by other boats, when the stake commences to descend by its weight, and as soon as it reaches the mud, the rope at the bottom of the stake is drawn out, and two boats are made to hang on by a string which is attached to the top of the stake, and by means of working it from side to side it is sent down some 12 feet into the mud. A number of stakes are thus put down 25 feet from each other, and long nets made of hempen twine are tied to them. The fish are driven into the nets by the force of the tide, and are taken out by the *Kolees*, who always remain on the look out. A stake costs between Rs. 10 and Rs. 50, and a large net about Rs. 100.

After the fish has been brought on shore, that which is intended for immediate sale is taken to the bazar by *Kolee* women; the inferior sort is thrown out on the sand to dry, and afterwards sold as manure. The *bumaloes* and a few other descriptions of fish are salted and dried; and if sharks are captured, their maws are cut off, dried and sold to *Khojas*, who export them to Bombay, from whence they find their way to China.

The fishing-boats are considered to be amongst the swiftest sailing vessels known: they are very sharp in the bows, with hollow keel, well rounded in the stern, and the mast slopes a little forward. These vessels are chiefly made of teak, and cost from Rs. 300 to Rs. 400. They last about 40 years.* The annexed are diagrams and cross sections of a Colaba fishing-boat or *muchwa*, which may tend to assist the descriptions above given.

The *Kolees* and their wives are also often employed in carrying grain to the different large coast villages from the interior.

They are a hardy race, of short stature, and inclined to corpulency: their arms are more muscular than their legs, owing to the nature of their occupation.

* The Sir Patel of the *Kolees* states that he had a fishing-boat given him by his father, which was in constant use for about 100 years: so much for the durability of teak in water.

The Kolees, of this district are of Mahratta origin, but do not rank so high in caste as the Mahrattas, who do not eat or intermarry with them. They dress like the Mahrattas, but most of the men wear a small skull-cap instead of the turban. The women do not wear cholees or jackets, like other Hindoos of their sex.

Their condition is said to have been much bettered since the lapse of the State; and no wonder, for under the late Government they laboured under a great number of taxes, which have since been completely abolished. The only thing they complain of now is that salt being dearer, owing to the heavy duty imposed upon it, they are often unable to salt all the fish they capture, and consequently lose a good deal by this; but no reliance can be placed upon their statements. They are the greatest drunkards amongst the Hindoos, and their intemperate indulgence in liquor may often be the cause of their inability to procure salt. Indeed mostly all the Kolees are inveterate drunkards, and something ought to be done to curb their passion for liquor. I believe there are only a few (perhaps half a dozen) who abstain from it.

The Sir Patel, or chief of all the Kolees along the coast between Callian, Bhewndy, and Hurnee, named Wagh Patel, resides in Alibagh, and to him all cases are referred by the Kolees regarding fishing-stakes, which are considered as real property, and caste disputes, &c. He possesses great influence among his people, but it is becoming less every day. His grandfather Lacc Patel was a great man in Colaba: he had charge of Angria's little fleet, and his ancestor Kanojee Patel having been installed in his office of Sir Patel by no less a document than a sunnud from the King of Delhi, the family possessed unlimited power amongst the Kolees, and even could execute people of their caste for infringement of the laws.

The *Bhundarees*, or toddy extractors, are also only to be found in the plantation villages along the sea coast. They are of the Shoodra caste, and are, no doubt, of Mahratta origin: they are of about the middle stature of Natives in general, and are rather fairer than the cultivators and the generality of Mahrattas, and are also better looking; and some of them have very intelligent countenances. They are remarkably well made, and muscular, owing to their constant occupation of climbing cocoanut trees, which they are very expert in doing. No string is used, as is the custom in some parts of Bombay and the Northern Konkun, but they ascend by means of notches cut in the trunk of the tree about 2½ feet apart. The calabash into which the toddy is emptied, as described in page 7, is hung on a hook, which is tied to the waist. The Bhundarees are also distillers of the toddy they extract, though from their primitive mode of converting the juice into liquor they do not make so much as would be surmised from their large number; and, indeed, if the population of Colaba were only dependent upon the Bhundarees for its alcoholic beverage, we should not meet with so much drunkenness as now unhappily exists. The

Parsee contractor who has the annual farm of the great liquor contract has nothing to do with the plantation villages, as he would thereby destroy the occupation and privilege of the Bhundarees, by underselling them with the mowra* liquor, which is manufactured in gallons in Rewus and Pejharee. The Bhundaree's still is a very primitive affair, and consists of two earthen pots, connected together by a hollow piece of wood. The larger of the pots is the boiler, and contains the toddy, the steam from which passes through the tube into the other pot or condenser, which is partly buried under ground, and is every now and then sprinkled with water.

It is strange that the Bhundarees seldom partake of the liquor they make: drinking of toddy before it is fermented is also not allowed by the caste rules.

There is a tradition extant of their having been brought from Goa to this part of the coast by the Portuguese, but how far this is true I have not been able to ascertain. They were, however, of great assistance to the Portuguese, in repelling the constant attacks of the Mahomedans, and afterwards of the Mahrattas, on the fort of Rewdunda or Cheol; and the Portuguese in return appear to have endeavoured as much as laid in their power to conciliate the good will of the Bhundarees, as we find from a very interesting document in the possession of the Muccadam of the Bhundarees at Rewdunda, a translation of which I have been enabled to give through the kindness of Mr. N. Fernandez, Translator to Government, as also of a certificate to Bhewjee Naique, a Muccadam of the Bhundarees, testifying to his fidelity, zeal, and valour in the service of the King of Portugal:—

“Dom Rodrigo da Costa, of the Council of State of Her Majesty, Viceroy and Captain General of India, &c. maketh it known to all who this document may see, that being informed that the Bhundarees of the fields of the fort of Cheol and its dependencies are very much oppressed and ill-treated by the owners of the lands and cocoanut oarts within the above places, inasmuch as they are forcibly made to farm their estates and lands which they own within that jurisdiction against their will: with the view to avoid this, I do hereby command, that no person of any quality or condition whatsoever shall ever compel or force violently the said Bhundarees of the fort of Cheol and its dependencies to farm out their said estates and cocoanut oarts against their will. By acting contrary to this order, the whole of the profits thus made shall go to the Government. The requisite order for the due execution of this order being given by the executive Captain of this fort of Cheol, and the Officers of the Senate of the Chamber at this place, on due application being made to them by the suffering parties through the Factor of Her Majesty; this step being considered to the interests of the service of the said sovereign, and peace of the said Bhundarees. This is hereby notified to the

* The mowra is the flower of a tree which grows in the Northern Konkun and Guzerat.

abovementioned Captain of the fort of Cheol, and to the Senate of the Chamber, Factor, and other officiating ministers and persons concerned, who will duly give effect, and see that due effect is given to this order, as above explained, without any alteration; paying no new fees or those of the chancery; this being upon the service of Her Majesty.

“Registered in the Factory of the fort of Cheol, and the Senate of the Chamber thereof.

“Written by Gregorio Manara Sara, at Goa, on the 13th of July 1711.”

The Bhundarees speak well of the Portuguese Government, which they say was always ready to give them redress for injuries done to their estates by the Mahomedans, who were stationed in the neighbourhood at Cheol; and the other Hindoos living in the town of Rewdunda were also protected from insult, and allowed to perform all their religious ceremonies till a little before the termination of their power in India, when they commenced a religious persecution against their subjects.

The following is a translation of the other certificate above alluded to:—

“Caetano de Souza Pereira, Nobleman of the Household of His Most Faithful Majesty, whom God preserve! Captain and Governor of this Fort of Cheol, appointed by the said Authority, &c.

“I do hereby certify, that on my coming to govern this fort of Cheol, I found Bivanjee Naique, Chief of the Bhundarees, holding that office; and in the course of my triennium, (space of three years,) I observed in him great fidelity, zeal, and valour in the service of the said Sovereign, being constantly, both by day and night, on due watch upon the fields, with his Bhundarees, and never failing in the duties entrusted to him by his appointment; proving himself in all respects to be a loyal subject of the said Most Faithful Majesty, whom God preserve! whereby he has rendered himself entitled to the mark of honour and favour which the said Sovereign is in the habit of showing to such persons as so serve him. In truth whereof, I have caused this to be

given under my hand and seal, upon my oath, &c. &c. as to the veracity of all that I have asserted above. Given in this fort of Cheol, the 21st of January 1737."



Although the sentiments expressed in this certificate were highly favourable to the Chief of the Bhundarces, it does not appear that he was rewarded in any substantial manner for his loyalty to the King of Portugal.

The several sub-divisions of the *Brahmin*, *Shenwi*, and *Purbhoo* castes are so well known, and have been so often described, that it only remains for me to say something regarding their employment and condition. The greater part of the Brahmins and Shenwis are employed in agriculture, and many of the former are the principal landholders in the district: the very poorest are to be seen performing the lowest drudgeries of the fields; but most of them occupy themselves in superintending labourers, whom they engage to cultivate their ground. There are a good number of Bhuts, who are supported in idleness by the superstition and ignorance of the Hindoos, but they, comparatively speaking, get very little in the way of alms; in fact, the Brahmins often complain of the want of charity now-a-days on the part of the Hindoos. There are a few money-lenders, Sowcars, Vukeels, and Karkoons of this caste, but the two latter occupations are mostly monopolized by the Purbhoos, who are just as intelligent and subtle as the Brahmins, whom they try to imitate in every respect, both in regard to food and dress. With respect to the caste ceremonies, they are more formal, and strive to act up with greater strictness to the laws laid down in the Shasters than the Brahmins themselves: they even go so far as to repeat the "Gaitree," and perform other rites, such as the "Hom," &c. which belong to the Brahmins alone. These encroachments on the priestly power have produced feelings of bitter animosity between the two castes.

The Purbhoos in this district are of the Kayust class, and profess abhorrence to meat; though it is maintained by their opponents that they are not only flesh-eaters, but are also addicted to drinking.

The condition of the Purbhoos has improved since the lapse, whilst that of the Brahmins and Shenwis may be said to have fallen off, which they attribute to there being no dukshuna distributed among them, as was formerly

the case; and that the Hindoos do not respect or obey them as before, and consequently, that alms and feasts are not so common now. It is, however, certain, that owing to this, the Brahmins have become more industrious, and, in time, they may by honest labour regain what they have lost since the introduction of the British rule.

The *Sonars* or goldsmiths rank next to the *Purbhoos* in respect to caste: they, however, assert that they are superior to them, and some even go so far as to arrogate to themselves a position equal to the Brahmins.* It is, however, notorious that they are a crafty and an unscrupulous race, but persevering and patient. The *Sonar* is as indispensable in a village as the *Bhut*, and consequently no large village is to be seen without its goldsmith, who generally has about the best house in it. The *Sonars* are solely employed in this district in making the common golden and silver ornaments used by the Natives, who are obliged to exercise great vigilance to prevent fraud.

The *Wanees* are composed of two castes, the *Goozur* and *Marwaree*, and their number may be said to be equal; but in the town of *Alibagh* the former exceed. The *Goozurs* keep together; but the *Marwarees* may be found in ones and twos in all the large villages. They are shopkeepers, money-lenders, and merchants, and *it is said* that they have become more numerous since the lapse of the State: but this can be easily accounted for, as the *Dewan*, *Venaik Purushram*, who was sole merchant and money-lender, had an interest in keeping them out of the territory, in order to enable him to fill his own coffers the more easily; and if the people were kept out of the hands of the *Wanees*, it was not done from any philanthropic motive to protect them, but merely to meet his own sordid views. The *Marwarees* are the most unprincipled money-lenders in India, and are the bane of the cultivating classes. They charge the most exorbitant interest, and increase it still more to an incredulous extent by contriving to have money debts defrayed in kind, which gives them an opportunity of exercising the most wonderful ingenuity in defrauding the cultivators of the hard-earned produce of their land; and the only compensation they make is by being ready with their money when Government rent becomes due. But, as before stated, the ryots must be taught to keep out of the hands of money-lenders by giving up drink, and being more economical in their marriages and feasts.

The *Mhars* come under the head of low castes, and are chiefly employed as wood and grass-cutters, and measurers of land under the supervision of *Karkoons*: they remove all descriptions of carcasses from the towns and villages, and eat those of bullocks and buffaloes. They are held in abhorrence by the Hindoos, and, consequently, their houses are always situated on the outskirts of a village, or at a distance from it.

* It is said that the *Sonars* in Bombay, under their distinguished leader *Juggonath Sunkrsett*, have upset the old order of things, by declaring that they are of a superior caste to the Brahmins, and consequently pronounce it defilement to eat with a Brahmin. They have also *Bhuts* of their own caste, to officiate at ceremonies.

It is a strange fact, that this useful class of people were kept as much as possible out of the district by the Native Government, and those that were in it were treated with great rigour. The Mhars are much given to drink, and it is to be feared that while under the influence of liquor they are very often mixed up in petty gang robberies. This may have operated in preventing them establishing themselves in large numbers in these territories during the Native rule.

The *Chambars* are also among the low castes : they are employed as shoemakers and curriers, but very little leather is prepared in the district ; it is got chiefly from Bombay and Poona, and converted here into Native shoes and sandals. The *Chambars* are a quiet, industrious class, but very slow in their work, which is of the coarsest kind.

After a brief account of the *Kathkurees* and *Khutrees*, of whom I apprehend very little is known, we will have finished with the Hindoos, and can then proceed on to an account of the Mahomedans and Israelites.

The *Kathkurees* or *Katodies*, one of the aboriginal tribes of India, are a wild race, who occupy the fastnesses of the mountains all along the Konkun and the Sahyadri range. They derive their name from the *kath*, or terra japonica, which they extract from the *khair* tree ; and during their operations they will allow no one to enter their encampments, for fear, as they say, of disturbing the juice while undergoing inspissation ; but the Hindoos attribute this caution to another motive, viz. that of preventing the mode of the preparation becoming known. The *kath* is bought up from the *Kathkurees* by petty traders at a trifling cost, and sometimes petty articles of clothing are even given in exchange.

There are 370 *Kathkurees* in this district : they are considered to be a migratory race, but those in Colaba do not appear to go any distance from the district, but they merely move about from village to village, just as circumstances suit them, for the purposes of cutting firewood for sale, and making charcoal, or cultivating *wurkus** land, or following their occupation of extracting the *kath*. The chief locality of the *Kathkurees* in this district is on the eastern slopes of the hills, between Poenar and Oomtai and Chowra. The villages of Beedwagla and Koordoos, near the banks of the Nagotna creek, appear to be the favourite haunts of these denizens of the forest, owing, no doubt, to their propinquity to the hilly jungle.

The *Kathkurees* are a small race, of very dark complexion, with smooth skin, and of spare though muscular make, with very low foreheads ; and the women have very curly hair. The men wear shendies like the Hindoos, but do not use turbans, nor do the women wear cholees.

* This is land on the slopes of the hills, which can only be cultivated for a few years, and must then be allowed to lie fallow for two or three seasons before it can be taken up again, so as to allow a re-collection of the detritus. Hemp, nachnee, and wuce are grown on this description of land.

They are spoken of by the higher class of Hindoos as being of very ancient origin, and this the Kathkurees themselves believe: they have a tradition that they are descendants of the monkeys and bears which Adeo Narayun, in his tenth avatar or incarnation of Rama, took with him for the destruction of the demon Rawun, the sovereign of Lunka or Ceylon; and on coming off victorious he blessed the monkeys and bears, and told them that they would become human beings in the kuliyoog, or the fourth or sinful age of the universe. It is a strange fact that the Kathkurees will under no circumstances repeat the name of Rama except on their death-bed, when they keep muttering it as long as they can.

It is difficult to learn anything from them regarding their manners and customs, which are very curious, and unlike those of the Hindoos in many important respects. As far as I have been able to ascertain, it would appear that there are two principal divisions, viz. the Dhor Kathkuree* and the Mahratta Kathkuree†; those of Colaba belong to the latter. They are again sub-divided under separate clans, called Helam, Powar, and Gosavee‡: those of this district are principally of the Powar. They acknowledge the existence of God (Eeshwur), and believe that people are affected by malignant spirits; they practise incantations, and invoke curses, in which the Hindoos consider them great adepts, and are consequently exceedingly careful against the possibility of offending a Kathkuree, who, they also believe, has the power of transforming himself into a tiger; and the Kathkurees of course have an interest in favouring this absurd belief. They have, like the Mahrattas, their particular household gods, such as Bhowanee, and Vetul, &c.

The women, unlike the Hindoos, are more on a level with the men. Brahmins are never called in to officiate at their ceremonies. Marriage takes place at the adult age, and is got over in a very summary manner; and in most cases, before the ceremony takes place, the parties live for some time together as man and wife. The girl is generally allowed to choose a husband, and the choice nearly in every case falls on the person with whom she has had some previous intercourse: she breaks the subject to her parents, who assemble the caste on some lucky day, and, before all, the parties acknowledge each other; a few words are then muttered by one of the older Kathkurees, and some twigs are stuck on the head of the bride, and then on that of the bridegroom. All then sit down to a repast of Kathkuree delicacies, such as nachnee or rice, field rats, monkeys, and squirrels, finished off by copious draughts of

* The term Dhor Kathkuree is applied to them as being cow-eaters.

† This division, under the head of Mahratta Kathkuree, is no doubt of very late origin; and as they do not show any abhorrence to cow-flesh eating when questioned upon the subject, it is not unlikely that the Hindoo Government may have interdicted it. I questioned some Kathkurees upon the subject, and their only answer was, that if they were to eat the flesh of the cow, the Hindoos would not even so much as allow them to enter a village.

‡ Two others, the Jadava and the Sindhi, are mentioned at page 291 of the Rev. Dr. Wilson's "Evangelization of India."

liquor ; and the guests keep drinking and dancing until they become fairly intoxicated, which closes the scene. Children are named on the fifth day after birth : the names are the common Mahratta ones. The dead are burnt, if wood is at hand ; if not, the bodies are buried, with a small pot of rice, and the bones are afterwards taken up at some convenient time, and reduced to ashes. Persons dying from cholera are always buried first, and the bones taken up after the expiration of some months and burnt.

The language now used, though it is nothing more than corrupt Mahratta, yet contains a number of other words, which evidently appear to be the remains of some language which has become extinct. The following are a few words which I noted down while engaged in conversation with a Kathkuree man and woman, and I had their accuracy tested afterwards by another Kathkuree, who was not a little astonished when I repeated them, and asked him to tell me their meaning in Mahratta, which he did, and I found them all correct :—

आख*	(Akh) call.	मोरगे	(Moregai) hawk.
आनज*	(Anuj) boiled rice.	ली	(Lee) take.
आदीडा	(Abedda) a hedge-hog.	वेप	(Wope) give.
आळाव	(Alav) a kite.	सकई	(Sukae) a large earthen vessel, corresponding with the Mahratta <i>raujun</i> .
कीरलू	(Keerloo) a crab.	सालू	(Saloo) turban.
कुकडे*	(Kookdai) fowl, cock or hen.	सुना	(Soona) dog.
गोहर*	(Gohur) an iguana.	सोरा	(Sora) boy.
चुंबोती	(Choombotee) an arrow.	सोरी	(Soree) girl.
टाकी	(Tahkee) sleep.	हाद्या	(Hadia) crow.
नागुळ्या	(Nagoolia) a mongoose (<i>Viverra</i> , <i>Ichneumon</i>).	होडस	(Hodns) man.
बगाड*	(Bugad) a kind of crane (<i>Ardea</i> <i>Terra</i> and <i>Pulla</i>).	होडोस	(Hodees) woman.
बुंधा*	(Bundia) a small earthen vessel.		

The Kathkurees' miserable-looking hovels, which are mostly built up of reeds, and the covering made of a little rice straw carelessly thrown on the top, are always situated on the outskirts of some small village, as this savage race is held in abhorrence by the Hindoos. They eat every description of flesh, the cow† and brown-faced monkey excepted : the latter they say has a human soul. Their general food consists of *nachnee* and field rats, or squirrels, porcupines, iguanas, monkeys, civet cats, deer, swine, and doves, partridges, &c. Their little children are great plunderers of the nests of the feathered tribe, which they are very sharp in finding out. Though the Kathkurees are so indiscriminate in their food, yet they would scorn to take fragments of victuals, even if offered by a Brahmin.

The Kathkurees do not understand the use of fire-arms, but they use the bow and arrow with some dexterity : they snare and kill a good deal of game,

* The words marked thus * have some affinity to the Mahratta, and several other words to the Guzerattee.

† There are no Dhor Kathkurees in Colaba, as before stated.

which is too often sold for liquor; but the men do not go into the village to dispose of it, or to purchase articles of food,—these are considered to be the wife's duties.

The Kathkurees enjoy excellent health, and are very hardy. This is attributed by the Hindoos to their great knowledge of medicinal plants and herbs, and not to their constant climbing of hills, which they do like wild goats, and to their long foot-chases in pursuit of game. The women are also as hardy as the men, and it is not an uncommon thing with them, when taken suddenly ill, even while working in rice fields in the rainy weather, to go behind an embankment and give birth to a child, and, after washing it there and then in cold water, to put the new-born babe under the *veerla*,* and commence working again as if nothing had happened.†

But in spite of all their hardiness, the Kathkurees are cowards, and a great feature in their character is want of resolution; and this is sufficiently attested by the fact of their seldom committing daring gang robberies, and even when they do, the whole band is never composed solely of Kathkurees—it is found necessary for the leader to be of another caste, as well as a number of the gang. The Kathkurees are being constantly taken up for agrarian robberies, and plundering lone travellers: the women are also just as bad as the men in this respect. There are out of their small number, amounting in all only to 372, including men and women, 13 convicts now in the Colaba jail for various offences, as detailed below, some of them of a very heinous description:—

Males.	Females.	Total.	Crime.	Sentence.
1	..	1	Attempt to murder his wife in a fit of intoxication, and escape from prison.	Imprisonment with hard labour for five years and six months.
2	..	2	Robbery with force	Imprisonment with hard labour for five years each.
4	..	4	Ditto ditto	One year's imprisonment each, with hard labour.
1	..	1	Escape from custody... ..	Six months' imprisonment, with hard labour.
..	4	4	Gang robbery	One year's imprisonment each.
..	1	1	Attempt to commit robbery.	Six months' imprisonment.
Total.. 8	5	13†		

* The *veerla* is a covering made of bamboos and leaves, and is worn by Natives to protect them from rain: it hangs on the head, which it covers, as well as the upper half of the body, and is impervious to rain.

† The Hindoos look upon this as something extraordinary, as their own females, under such circumstances, are so delicately treated, that they are even afraid of exposing them to the slightest current of air. The Kathkurees are therefore looked upon as belonging to the brute race.

‡ What a contrast this affords to the Beni-Israelites, who are three times as numerous, and there is not one in jail.

They are often compelled by the yearnings of hunger to resort to unfair means to procure their food, but this is solely brought about by their dreadful passion for liquor, which is so great, that it has often been known that they have pawned the only rags upon their bodies to get even a little of this soul-debasing liquid: the more heinous crimes out of those shown above were committed while the parties were under the influence of liquor.

Something might be done to induce them to abandon this evil propensity, and they might be made a most useful set of people, instead of being the dread of the cultivating classes, and objects of general abhorrence; for, despite their bad qualities, they are tractable, and not insensible to any little kindness shown them.

I do not remember ever having seen an account of the Khutrees or silk-weavers; and the only place where I have met with the name was in Briggs' translation of Ferishta, where mention is made of them during the reign of Mahomed Shah Bahmuny I. as having been entrusted with "the business of the mint and of the bank," when the king coined money of a square form, and the Hindoos refused to circulate it, and commenced to melt it down. The Khutrees, moreover, in this passage, are called "the descendants of inhabitants of Delhi, who had formerly emigrated into the Deccan."

The Khutrees themselves state that they are descendants of the ancient Kshaitrees, who were a race of kings: they say they fled from the city of Cheol to the town of Rewdunda many years ago, when a plague broke out in that city and caused it to be deserted. Faria y Souza, in his work upon India, mentions that Cheol was a famous city for silk-weavers, and there can be but little doubt that the Khutrees were encouraged by the Portuguese to settle down in Rewdunda.

The Khutrees are of the Hindoo caste, and rank, perhaps, with the Panch-kulsees, but, unlike them, they do not wear the janwé or sacred string: they are as fair as the Brahmins, and much addicted to polygamy, for which they urge an excuse, viz. that they require a number of females in each house to assist in spinning.

There are only five looms in use now in Rewdunda, and the whole amount of the annual sale of silk is estimated to be under Rs. 1,500. The raw silk and colouring matter are brought from Bombay. The following are the several tools used in the manufacture, and the estimated prices of the same:—

	Rs.	a.	p.
1. Gada, or hand-wheel for unravelling the raw silk.....	1	8	0
2. Peetdee, a little piece of wood with a handle, upon which the raw silk is rolled in small quantities off No. 1.....	0	6	0
3. Rhol, spinning machine	10	0	0
4. Ada, frame set with pegs, upon which the silk is drawn off from No. 3.....	5	0	0
5. Mag, loom	10	0	0
Two large brass vessels for colouring the silk.....	10	0	0
Grinding stones for colours.....	2	0	0

Total....38 14 0

After the silk thread has been drawn off No. 4, it is boiled in water containing the impure carbonate of soda, and then washed out in fresh water, and afterwards soaked in alum, and pressed ; it is taken out next day, and put in the colouring matter, and afterwards sold as silk thread, or worked up into peetamburs, edgings for dhoturs, or strings for the waist.

The quantity of colouring matter required for one ounce of silk is as follows :—

Red.

- 5 drachms keermeej (cochineal).
- 2 ditto piesta (a bean of a pea-green colour).
- ½ drachm pudwas (a bean of a red colour).

Yellow.

- 3 drachms kupeela (a powder of a yellow colour).
- 3 ditto papudkhar (carbonate of soda).

Besides the above, the Khutrees cannot give silk any other colour ; and when required it is brought ready prepared from Bombay.

A few *Mussulmans* are to be found nearly in every large village in the district ; but in Shreegaon and Phopheree, in the salt batty lands, they settled down as cultivators from a long time back, and are a quiet set of people. Those in the towns of Alibagh and Rewdunda are chiefly in the employ of Government and private individuals as peons, &c. The women in Rewdunda employ themselves in making little skull-caps used by Mahomedans, which are covered over by a little fancy work.

The generality of the Mahomedans are as dark as the Hindoo cultivators, and there are only a few women in the towns of Alibagh and Rewdunda who are rather fairer than the rest ; but they do not belong to the original inhabitants of the place, being the wives and daughters of those who came here to seek employment as sepoys under the late State. The Mussulmans are a very dirty, indolent race, and their huts have always a slovenly appearance.

There is only one Kazeer in the district, and he resides at Alibagh : there are, besides, Moolnas in the large villages, who perform certain ceremonies, and act under the orders of the Kazeer ; but within the last few years, from a spirit of faction,—a great characteristic of the Mahomedans,—they have separated into two parties, one clamouring to have the Kazeer removed, and the other determined to uphold him.

To give an idea of the *Beni-Israelites* and their condition, I cannot do better than to quote the following from Dr. Wilson's "Lands of the Bible" regarding this interesting people, and I have only to add that they are one of the best-behaved set of men in the district, and during the course of the last six years, with the exception of petty cases of drunkenness and assault, there has not been a single Israelite brought up in a criminal case : since the lapse, only three have been convicted of criminal offences before the Agent's Court at Alibagh, and these occurred before 1845 :—

"The Beni-Israel possess no historical documents peculiar to themselves; they have no charters granted by Native princes, which are often a source of curious information; and their traditions are extremely vague and unsatisfactory. Their ancestors, they say, came to the coast of India from a country to the northward, about sixteen hundred years ago. They were in number seven men and seven women, who were saved from a watery grave, on the occasion of a shipwreck, which took place near Chaul, about thirty miles to the south-east of Bombay. The place where they found a refuge is named Navagaum.* They and their descendants met with considerable favour from the Native princes, though they conceived themselves to be sometimes forced to conceal their principles. As they increased, they spread themselves among the villages of the Konkun, particularly those near the coast, lying between the Bankot river and the road which traverses the country between Panwell and Bhorghat. In this locality, and also in Bombay, in which they began to settle after it came into the possession of the English, their descendants are still to be found. The population on this island amounts to about 1,932 souls; in the English territories in the Konkun to about 800; in the districts belonging to Angria to 870; in certain villages below the Ghat of the Pant Sachiva to 209; in the districts of the Ilubshi to 411; and in the Bombay Army, including women and children, to about 1,000. These numbers, which amount together to 5,255, I take principally from a census made under my own direction. They fall short of the general Native estimate by nearly 3,000, and possibly some houses may have been overlooked by the persons sent forth to collect information. The Beni-Israel in their physiognomy resemble the Arabian Jews, though they view the name Yehud, when applied to them, as one of reproach. They are fairer than the other Natives of India of the same rank of life with themselves, but they are not much to be distinguished from them with regard to dress. They have no shendi, like the Hindoos, on the crown of their heads, but they preserve a tuft of hair above each of their ears. Their turbans, angrakhas, and shoes, are like those of the Hindoos, and their trowsers like those of the Mussulmans. Their ornaments are the same as those worn by the middle class of Natives in the Mahratta country. Their houses do not differ from those of other Natives of the same rank. They do not eat with persons belonging to other communities, but do not object to drink from vessels belonging to Christians, Mussulmans, or Hindoos. They ask a blessing from God both before and after their meals, in the Hebrew language.

"Each of the Beni-Israel, generally speaking, has two names—one derived from a character mentioned in Scripture, and another which has originated in deference to Hindoo usage. The Hebrew names current among the men are the following:—Abraham, Isaac, Jacob, Reuben, (which is said most to abound,) Joseph, Naphtali, Zebulun, Benjamin, Samson, Moshe, Aaron, Eliezer, Phinehas, David, Solomon, Elijah, Ezekiel, Daniel, Sadik, Haim, Shalom, and Nashum. The name Judah, it is to be remarked, is not to be found among them. The Hindoo names by which they are most commonly known among the Natives are Saku, Jitu, Rama, Bapu, Sawandoba, Tana, Dhonda, Abau, Bandu, Nathu, Dada, Dhamba, Bala, Baba, Vitu or Yethu, Phakira, Yeshu, Satku, Apa, Bhau, Bapshah, Gauria, Pita, Bawa, Anandia, Kama, Jangu, Aba. Among these there are only a few which correspond with those of the heathen gods. Sarah, Rebecca, Rachel, Leah, Sapphira, Milcah, Zilcah, Miriam, and Hannah, are the Hebrew names given to the women. Esther, the favourite Jewish name, does not occur among them. The names derived from Hindoos which are found among them are Balku, Abai, Ama, Yeshi, Zaitu, Tanu, Hasu, Ladi, Baina, Aka, Ranu, Bayewa, Baia, Nanu, Raju, Thaku, Kalahai, Maka, Saku, Gowaree, Dudi, Saf, Sama, and Bhiku, Pithu, Wohn, Dhakalu. The Hebrew names are first conferred on the occasion of circumcision, and those of a Hindoo origin about a month after birth. The surnames of the Beni-Israel are generally derived from the villages in which they originally settled. The vernacular language of the Beni-Israel is the Mahratta. A few of them, however, are able to converse in Guzerattee and Hindustanee. The Beni-Israel

* This place is about four miles and a half to the north of Alibagh.—W. M. H.

resident in the Konkun principally occupy themselves in agriculture, or in manufacturing oil. Those who live in Bombay, with the exception of a few shopkeepers, are artisans, particularly masons and carpenters. A few are blacksmiths, goldsmiths, and tailors. Some of them, generally bearing an excellent character as soldiers, are to be found in most of the regiments of Native infantry in the Bombay Presidency; and few of them retire from the service without attaining to rank as Native officers. There are not many of them who possess much property. Their head man in Bombay, however, is believed to possess one or two lakhs of rupees. A considerable number of families are supposed to be worth from Rs. 1,000 to 5,000. Like the Parsis, they do not tolerate professional begging beyond their own community.

"In the Company's territories, the Beni-Israel enjoy all the toleration which they can desire. In the district of country belonging to the petty Hindoo prince Angria, in which many of them are to be found, they take the same rank as Mussulmans. In that belonging to the Hubshi, or Mussulman chief of Jiziri, they are viewed as on a point of equality with the agricultural Mahrattas.

"All questions respecting the caste and religious discipline of the Beni-Israel are determined in a meeting of the adult members of the community in each village, by their Muccadam, or head man, who has a kind of magisterial authority in the community, and the Kadhi, who is the president in religious matters, and the conductor of public worship, and whose duty it is to entertain the complaints which are made to them. The Muccadam and Kadhi have generally the assistance of four Chogale or elders: any of the people present at an investigation, however, may express their sentiments on the subjects under discussion, record their dissent, and, in certain circumstances, procure a new trial.

"The Beni-Israel all profess to adore Jehovah, the God of Abraham, of Isaac, and of Jacob: many of them, however, till lately, publicly worshipped, and some of them at the present time secretly worship, the gods of the Hindoos, particularly those who are supposed to have a malevolent character; and a few of them practise divination. Though they have remained quite distinct from the people among whom they have been so long scattered, we see the applicability to them of Deuteronomy xxviii. 64: 'Thou shalt serve other gods, which neither thou nor thy fathers have known, even wood and stone.'

"The Beni-Israel have in their synagogues no Sepher-Torah or MS. of the law like the Jews; they admit, however, the divine authority of all the books of the Old Testament. It is only lately that they have become familiar with the majority of the names of the inspired writers, and it was not without hesitation that they consented to acknowledge the latter prophets. From the Arabian Jews, they have received the Hebrew liturgy of the Sephardim, which they use in their religious services. A few copies of the Cochin Ritual, printed in Amsterdam about the end of the seventeenth century, are to be found in their hands. One of their number has a copy of one of the Targums, but I do not know that it is turned to any account. Parchments bearing small passages of Scripture are sometimes worn on different parts of their bodies. It is understood that of late they have almost universally abandoned the use of charms, to which the example of the heathen had made them in some degree partial.

"When a birth takes place in any village in which the Beni-Israel are not very numerous, they almost all visit the house, and are entertained with sweetmeats or fruits. Circumcision is performed by the Kadhi on the day appointed by the law of Moses. The rite is considered as marking descent from Abraham, but no spiritual meaning is attached to it, except by individuals who have had intercourse with Christian Missionaries. The ceremony is attended by a considerable number of people, who are hospitably entertained, and invoke the health of the child over the juice of the grape. The Kadhi generally receives from 8 annas to Rs. 2 for his services. Small presents are sometimes given to the infants. The marriages of the Beni-Israel generally take place as early in life as among the Hindoos. The arrangements

connected with the betrothment are those of the parents. The ceremonies of marriage continue for five instead of seven days, as with the ancient Jews, and they are in some respects of a heathenish character. On the first day, the bridegroom is restrained from going abroad, is bathed, and gets his hands stained red with the leaves of the mendi (*Lawsonia inermis*), and the front of his turban ornamented with yellow or white paper, cut in the form of the flowers of the champa (*Michelia champaca*), while he is visited by his relatives, who begin to feast and rejoice. On the second day, his neighbours, without distinction, are invited to participate in the hospitality of his father's house, while he is required to have his hair dressed, and to array himself in his best apparel and ornaments. He is then mounted on a horse, and conveyed with the usual clang and clatter of the Natives to the place of worship, where a part of the marriage prayers of the liturgy is read, and a blessing pronounced by the Kadhi. From the masjid he is conveyed to the house of the bride, where he is received by her father, and seated among the assembled multitude. A dress and ornaments for the bride are presented in his name, and by the hands of his father, to the bride, who immediately turns them to use. A couch covered with clean cloth is then produced, and on it the happy pair are seated together. All the visitors stand before them. The Kadhi takes a cup containing the juice of the grape, which is viewed as a token of the covenant about to be entered into, invokes the blessing of God upon it, and puts it into the hands, first of the bridegroom, and afterwards of the bride, who both drink a little of it, as soon as they have been questioned as to their willingness to enter into the married relation, and faithfully to discharge their respective duties. The marriage covenant, drawn out in the form usually observed by the Jews, is then produced and read, and after being signed by the individual in whose handwriting it is, and three other witnesses, it is placed by the bridegroom in the hands of the bride. She holds one end of it, while he holds the other, and declares it to be a legal deed. He then folds it, and gives it into her possession. She disposes of it by committing it to her father's care. The cup is again tasted, certain passages of the Psalms are read, a ring is placed by the bridegroom on the fore-finger of the right hand of the bride, and the religious part of the ceremonies is closed. The Kadhi blesses the espoused seated together, and they receive offerings, principally in small sums of money, from their acquaintances. Feasting and rejoicing conclude the labours of the day. Next evening, the bridegroom and bride leave the bride's house, the former seated on a horse, and the latter in a palanquin, and proceed, amidst the firing of squibs and rockets, to the masjid, where they receive a fresh benediction from the Kadhi, before going to the house of the bridegroom, where they dine along with their assembled friends. Amusement and feasting continue during the two subsequent days. The marriage covenant is in general rigidly respected, even though its violation is but slightly punished. The innocent member of a family is allowed a divorce, and the liberty of re-marriage. The offending party, in the lax discipline of the community, is seldom prevented from having similar privileges, when he has the means of purchasing them. Polygamy is practised in a considerable number of families, but there are no instances known of a man having more than three wives. A few individuals keep concubines. Barrenness, as of old, is reckoned a great misfortune, and children are adopted by written covenant on a failure of issue. Females are not so degraded among the Beni-Israel as among the Rabbinical Jews; but they are not allowed to go to the masjids for the purpose of worship. The interments of the Beni-Israel quickly follow the death. They bury, without coffins, in graves of three or four feet in depth, the head of the corpse being placed towards the east. They sometimes make offerings to the deceased of rice, milk, cocoanuts, and sprinkle water mixed with flour, at the time of the interment, and they visit the grave on the third, fifth, and seventh days after it is closed, for the purpose of prayer. They have also an annual ceremony in behalf of the dead, like that of the Hindoo Shraddh. Their formal mourning for the dead lasts seven days.

"The Beni-Israel reckon their day from sunset to sunset. They now denominate their months by the Hebrew names. The weekly Sabbath is, in some degree, observed by about a third of the population. At six in the morning they assemble for worship in the masjid,

where they remain for two or three hours, principally engaged in reciting prayers or parts of the Scripture after the reader, and practising genuflexions. A few of the more devout of their number may be seen in the masjid about midday, or about two or three in the afternoon. The evening service is that, perhaps, which is best attended. It lasts for about two hours, and is frequently concluded by the persons present touching with their lips the cup of blessing.

“ The day of the new moon is very little observed by the Beni-Israel, unless it may happen to fall on the Sabbath. In a few houses, and also in some of the masjids, the prayers and lessons appointed for the day are read as they are given in the liturgy of the Sephardim. On the fifth, sixth, seventh, eighth, ninth, or tenth of the month, when the moon is seen to increase, the readers of the synagogue, and a few other individuals, read the blessing of the moon, springing on their toes, with their faces toward that luminary. This custom, like most of the others connected with their worship, is allowed by the Beni-Israel to have been derived from the Arabian Jews. * * * The Beni-Israel practise occasional voluntary fasts, particularly when they are inclined to make vows. They observe no jubilee.

“ The brief survey which we have now made of the observances of the Beni-Israel might appear to warrant the conclusion that they are Jews, unconnected with the descendants of the Reubenites and Gadites, and the half-tribe of Manasseh, who were carried captive to Halah, and Habor, and Hara, and Nahar Gozan, (1 Chron. v. 26.) by Pul, King of Assyria, and Tilgath-pileser, King of Assyria : and unconnected also with the descendants of the Ten Tribes, who were carried captive to the same and neighbouring places by Shalmanezzer, after the fall of Samaria, in the reign of Hosea (2 Kings xvi. 6) : for they commemorate events with which it is difficult to see how these exiles could be connected, and some of which occurred posterior to the return of the Jews to their own land from Babylon, to which they were removed by Nebuchadnezzar. It is only at first sight, however, that such an inference seems to be authorised. The Beni-Israel most readily admit, that to this adoption of their present practices they have been led by the example and precepts of the Arabian and Cochim Jews, who from time to time have come to visit them, or to reside in their neighbourhood. The very fact that they require to be instructed by foreigners in the most solemn and interesting ordinances of their religion, as well as in other customs universally observed by the Jews throughout the world, is a presumption that they have been established for many ages in this country, and really belong to the long exiled sons of Israel. The Jews of Cochim, who say that they came to India immediately after the destruction of the second temple, or, according to their own historical notices, in the sixty-eighth year of the Christian era, have all along considered themselves distinct from the Beni-Israel of Bombay, of whose circumstances they have from time immemorial been well aware ; and the black Jews of Cochim, descendants of proselytes from among the Hindoos and the Jewish families which mixed with them, informed the late Dr. Claudius Buchanan, when he was making inquiries about the Ten Tribes, that it was ‘ commonly believed among them that the great body of the Israelites is to be found in Chaldea ; but ‘ that some few families had migrated into regions more remote, as to Cochim and Rajapur in India.’ The last-mentioned place is the district of country bordering on the Nagotna creek, in which many of the Beni-Israel are even at present settled. The want of a MS. Sepher-Torah, or book of the law, among the Beni-Israel, places them in a situation in which we do not see any congregation of Jews throughout the world. The repudiation, to this day nearly universal among them, of the designation ‘ Jew,’ of which, no doubt, they would have been proud had they merited it, and the distinctive appellation of ‘ Beni-Israel,’ which they take for themselves ; the non-occurrence among them of the favourite Jewish names Judah and Esther, and the predominance of the names principally connected with the early history of God’s highly favoured people, appear to me to be circumstances strongly corroborative of the opinion that they are indeed Israelites, a remnant of the posterity of the tribes which were removed from their homes by the Assyrian kings.

" In the view which we have been led to take of the Beni-Israel, they must be considered as possessed of peculiar interest, even among the seed of Abraham, connected with whose dominions the most wonderful providences, noticed either by sacred or profane history, have been developed. Amongst Christians, they must be 'beloved for the fathers' sakes'; and it must be our desire and endeavour that through our mercy they may obtain mercy. Their situation, if properly explained to the Hindoos among whom they dwell, might facilitate the illustration of the historical testimony to the truth of the Scriptures which the general ignorance of events which have occurred beyond the bounds of this country renders it a matter of difficulty for many to understand. They have never, as a body, proved averse to Christian education, and they have always been ready to receive and peruse the Bible.

" About twenty years ago, the American Missionaries took several of the Beni-Israel into their employment as Mahratta teachers, and from about 100 to 140 of their pupils were of the children of that community, and till 1836 instructed in reading, writing, and accounts. About thirty individuals began the study of Hebrew at Alibagh in 1829, but they did not long persevere.

" Mr. Sargon, a converted Cochin Jew, instituted for the Madras Jews' Society six schools for their benefit in 1826, which at one time were attended by 165 scholars. They continued in operation for about four years.

" The Church (of England) Missionary Society has a Hebrew and Mahratta school in Bombay, which a few months ago was attended by about 70 or 80 scholars, from which more than the half, however, have been withdrawn, in consequence of some misunderstanding in the Beni-Israel community.

" The Mission of the General Assembly of the Church of Scotland, under arrangements proposed by myself, commenced the work of Christian education among the Beni-Israel in 1837; and 210 pupils, 159 boys and 51 girls, are now receiving instruction in connection with its schools. Of these, 19 youths have entered on a course of superior study in the English institution in Bombay; the others, with the exception of 11 girls of this place, belong to the villages of Panwell, Alibagh, Rewdunda, and Ambepur.*

" The education of the Beni-Israel, the dissemination among them of the Scriptures, and the addresses of Missionaries, are producing visible effects throughout their community. They have already nearly banished from it the idolatry and divination which were formerly practised, and they have done much to awaken in it a spirit of liberal inquiry. I have heard several individuals declare that they could not show reason for refusing to acknowledge that Jesus is indeed the Messiah."

Languages.—The Mahratta is the dialect of the country—it is even used by the Mahomedans and Beni-Israelites; and although some of the better classes of the former speak Hindustanee, yet the greater bulk of them, and the whole of the Beni-Israelites, use no other language, even in their domestic conversation; but their pronunciation of it is not even so good as that of the lower orders of the Koonbee caste. The Brahmins, Shenwis, and Purbhoos of course speak the pure Mahratta, and in a correct style; yet out of their whole population there are only a few, perhaps eight or ten, who have studied the Mahratta grammar, and these in nine cases out of ten must have been educated either in the Bombay or Poona Government schools: the rest of the population, even the Brahminical portion, are quite ignorant of the existence of such a thing as *wyakrun* (*i. e.* grammar), and those who have heard of it entertain most extraordinary notions regarding it. I have heard a Native say

* All these places, with the exception of Panwell, are in the Colaba Agency.—W. M. H.

that he could not think of taking up a work which would cost him fifteen years' labour to master, as he had been told by some of his friends.

The Sonars, Kasars, Tambuts, and Shimpees, and some of the Malees in the bagayut, are the only classes of the Shoodra caste who speak the Mahratta pretty correctly, and have a fair knowledge of the pronunciation. The Wanecs and Goozurs, in conversation amongst themselves, use Guzerattec and Marwarec; but having to deal nearly altogether with Hindoos, they are obliged to have a knowledge of Mahratta, but it is very limited, and the nasal pronunciation is used to such a degree that the language is hardly to be understood. The Kolees or fishermen, who form a large portion of the population, also use Mahratta, but their pronunciation of it is exceedingly barbarous, and the great number of corrupt words used in their conversation makes it difficult for a person to understand them; and when they jabber amongst themselves on subjects regarding their boats and nets, &c. they become completely unintelligible, from the constant use they make of nautical words, which they pronounce after their own style.

PART VIII.

EDUCATION, AND CHARITABLE INSTITUTIONS.

Education, and Method of pursuing it.—There are a few Native schools to be found nearly in every large village throughout the district, under the superintendence of some poor Brahmin, who has generally no other means of gaining a livelihood.

Of the boys who are taught in these schools, the greater number are of the Brahmin and Purbhoo castes; a few Sonars, Mussulmans, Mahrattas and Kolees may sometimes be seen attending them in the towns of Rewdunda and Alibagh.

The whole course of education consists in teaching the boys to write and read manuscript, the first rudiments of arithmetic (including a most extended multiplication table), of which by great practice they acquire a thorough knowledge. A few, perhaps, understand the rule of three, but I do not suppose there are more than half a dozen who have gone as far as compound proportion. No printed books are used, except in a few places which may have been visited by Missionaries,* who generally leave behind them religious tracts, which the master seldom objects to the pupils studying.

* Strange to say, that though Alibagh is only a few hours' sail from Bombay, the Missionaries of late years have not visited Colaba so often as might be expected, although there is a better field here for their labours than in any place on the continent opposite Bombay.

I calculate that there are about thirty schools of this description in the Agency, and the number of boys who attend them may be estimated to amount to 320. The sum paid for each boy is between 2 and 4 annas, and one pice and half a seer of rice at full moon (poonao), and the same again at new moon (ummawasa), thus making the whole amount to little more than from 3 to 5 annas.

There are three Beni-Israelitish schools in the Agency, viz. at Rewdunda, Ambepoor, and Alibagh, which were founded about twelve years ago, during the time of the Native Government; but they are not well superintended, and the masters, who are well paid, are not very diligent in their work, with the exception of the man at Rewdunda. These are free schools, and are attended solely by the Beni-Israelitish children; and the system of education is conducted on Christian principles.

A new school has been established by me in Alibagh by subscription, and is just now attended by about 60 children of the Brahmin, Mussulman, and Mahratta castes. English and Mahratta are taught to a few boys, who pay 6 annas each, and the rest, who are instructed in Mahratta, 4 annas. Religious works are used, but not just now made school-books of, though the Natives have no objection to allow their children to read them. As this school has only been established within the last few months, more cannot be said of it than that it promises to work well.

Charitable Institutions.—There are about seven dhurumsallas, or places for travellers to put up in, in this district. Three are situated in the town of Alibagh, two in Rewdunda, one in the village of Poenar, and one in Nagaon. The one at Poenar is on the high road between Alibagh and Penn, and is kept up at a small cost at the Government expense: it is generally occupied by travellers of all descriptions, excepting outcastes. The other dhurumsallas are not so much used: one in Alibagh serves as a hospital for the diseased, and one is used as a school.

There are no other descriptions of charitable institutions in the country.

PART IX.

LITIGATION, CRIME, AND POLICE.

State of Litigation.—The annexed table gives an accurate idea of the state of litigation in these districts, and the correctness of the information may be implicitly relied upon, the whole of it having been carefully compiled from the records of the Agent's Adawlut.

It is only necessary for me now to offer a few remarks in elucidation of the subject.

The increase in the number of cases disposed of, shown in column 5, over the number filed during the years 1846 and 1847, is owing to the cases remaining undecided of former years not having been included in column 1.

The progressive increase observable in the number of original cases filed during the five years may be attributable to the following causes :—*1st.*—Previous to the year 1846, there was only one Court in Colaba, viz. that of the Political Agent, who, having to attend to other important business in the revenue and political departments, could only devote a little of his time to the disposal of civil cases : the work accordingly fell into arrears, and the people felt less inclined to institute trivial cases when there was no prospect of a speedy decision ; but immediately on the opening of the new Court of the Moonsiff these cases commenced to flow in, which would otherwise very likely have been adjusted between the parties themselves. *2nd.*—The just, prompt, and systematic manner in which justice is now dispensed, on comparing it with the system under the former Government, when corruption and trickery were often resorted to, is no doubt one of the causes of the great increase. Rich and poor now resort in every case to the Civil Courts to obtain justice, which is dispensed to both alike, and which under the Native Government was often a question of doubt, from the notorious fact that money could, and often did procure unjust decisions, thereby making it matter of serious consideration for a poor man to proceed against a monied one or a person in favour at Court. *3rd.*—The great number of Vukeels attached to the Court, who are mostly residents of the place, are enabled, from the compactness of the territory, the furthest part of which can be reached in a day, to take advantage of Sundays and holidays to go out into the district instigating the people to litigation.

I must now proceed to explain the causes of the very remarkable increase in the year 1850.

The first is owing to the necessity of instituting regular suits for removal of attachments, instead of the summary process formerly in force in conformity with the Sudder Dewanee Adawlut's Circular dated 21th December 1847, No. 3398, which was in operation for upwards of two years, till it was cancelled by the Circular dated 6th February 1850, No. 491.

The second cause is owing to a rumour having got abroad, which is to some extent true, that Colaba is shortly to be annexed to the Tanna zillah, and this has caused the institution of a number of suits to avoid the stamp duty, and to obtain the execution of decrees before the executive power is transferred to the Judge of Tanna.

I will now close this subject with a few general remarks.

On comparing the averages of columns 1 and 5 of the preceding table, it will be seen that the disposal of original cases has kept pace with the filing, which reflects great credit upon the Courts. On the 31st December 1850

there was only one case remaining on the file above one year, and this was unavoidable, owing to the difficulty in solving a question of succession according to the Israelitish law. All the cases decided in the year 1850 were under the value of Rs. 2,000. The following table will give an idea of the nature of the suits disposed of during the years 1849 and 1850 :—

	1849.	1850.
Connected with land rent, at the instance of private individuals.....	23	29
Otherwise connected with land.....	55	66
Connected with debts, wages, &c.....	1,134	1,164
Ditto caste, religion, &c.	16	7
Total....	1,228	1,266

It is worthy of remark, that since the lapse of the State to the British, no cases were ever instituted in the Courts on the part of Government against ryots or other private individuals; and it is also very gratifying to be able to observe, that not a single cultivator was sent to the debtors' jail by the revenue authorities within the same period, and that only two sales have taken place for arrears of land rent due to Government.

The following table shows the average duration of suits and appeals for the years 1849 and 1850, and will give an idea of the facility with which cases are disposed of :—

		1849.	1850.
		<i>Yrs. m. d.</i>	<i>Yrs. m. d.</i>
Agent	{ Original suits	0 8 17	0 6 22
	{ Appeals	0 5 20½	0 7 16
Moonsiff's original suits		0 5 6½	0 4 28½

The disposal of appeals has also nearly kept on apace with the filing, and if the Agent had more time to attend to the Civil Court all cases would be disposed of within the year.

The following table shows the nature of the appeals decided during the two years 1849 and 1850 :—

	1849.	1850.
Connected with land rent .. .. .	..	..
Otherwise connected with land.....	9	13
Connected with debts, wages, &c.....	76	84
Ditto caste, religion, &c. ....	..	5
Total....	85	102

State of Crime.—The annexed table exhibits in detail all the crimes committed within the last six years, and the number of offenders apprehended and brought to trial, the number convicted and punished, and the number acquitted.

* The slight increase observable each successive year in the convictions to the number of offenders apprehended speaks in favour of the police.

The great proportion which column 50 bears to 49, viz. convictions to acquittals, is great, and to a person familiar with the workings of an European police it would appear more particularly so; but it can in some measure be accounted for from the fact of a number of persons connected with petty cases, such as assaults and abusive language, &c. having been entered on the district police officer's criminal files as offenders, but afterwards, owing to the amicable settlement of the cases between the parties themselves, and to the consequent abandonment of the prosecutions, the offenders, who in all probability would have been convicted on trial, are struck off as acquitted.

In page 29 of the printed pamphlet of the Report of Crime for 1848, published by Government, the Sudder Adawlut state that "in the zillah embraced in these returns the greatest number of convictions, in proportion to the population, appears in the small district of Colaba, and the least in the populous province of Ahmednuggur." The cause of this may be explained in the following manner, but before proceeding any further, it would perhaps be as well to remark, that in the density of the population in proportion to the size of the district, that of Colaba is equal if not greater than that of the zillah of Ahmednuggur. The cause of the apparent immorality in this Agency, on comparing it with the other zillahs, is easy of explanation. The first and greatest cause may be attributed to the large number of inhabitants, being in the proportion of 271 souls to the square mile, and these consisting of a number of castes, such as Koolces, Bhundarees, Brahmins, and Purbhoos, &c. who are remarkable for their proneness to contention and complaint. The next cause may be owing to the small size of the talookas, the farthest limit of any of them being within a few hours' walk to the district police officers' stations; whereas it is quite the reverse in every other talooka under the Bombay Presidency—consequently a great number of trivial complaints that come before the police officers in this Agency are never heard of in the other districts, where people to obtain redress are compelled to go a day's journey.

During the six years only three murders were *actually ascertained* to have been committed, and the culprits in these cases have been transported for life beyond seas. Five cases are entered in column 9 of the foregoing statement, but out of these two were never properly ascertained to have occurred, viz. the one in 1846, and one out of the two in 1850, and this requires explanation. One case, which was reported to be child-murder to hide the consequences of illicit intercourse, was of an exceedingly doubtful character, as is clearly shown in the proceedings of the Court of the 7th May 1846; and the report of the inquest was thrown out by the Court as altogether untrustworthy. As no murder was therefore proved to have been committed, strictly speaking it should not have been exhibited in the table of crimes. In the other case, which occurred in 1850, viz. murder in an attempt to procure abortion, by the administration of poison, as no poison was proved to have been given, or

that the deceased died an unnatural death, it should not, according to law, have come before the Court.

I have refrained from giving the estimated amount of property stolen, as such information can only be had from the losers, who are always in the habit of exaggerating the value of their articles to such an enormous extent that the police in many cases have, after the recovery and identification of the property, been exceedingly puzzled on comparing the actual with the estimated value as deposed to by the prosecutors.

The following table shows the number of people able to read and write out of those apprehended and brought to trial during the last three years:—

Years.	Number able to Read and Write.	Number Apprehended.
1848.	163	1,011
1849.	194	1,211
1850.	210	1,442
Total.	567	3,664

This gives little more than fifteen individuals who are able to read and write out of every 100, or 1 to 6; and this may give an idea of the state of education in these parts.

Police.—The police of this district may be considered to be unusually strong for such a small territory; but owing to the Patels of the several villages never having, previous to the lapse, been called upon to do the duties of Foudjars or village police, the stipendiary department, though unusually strong, is not nearly so effective as it might be if the village Foudjars understood their work better, and were made to take an interest in it by more liberal remuneration. Half of their original allowance was shamefully confiscated during the niggardly and grasping administration of the late ex-Dewan Venaik Purushram. Since the lapse, this subject has not only attracted the attention of the new rulers, but a suggestion has been made for the immediate introduction of a higher scale of payment,* and there is every probability of its being sanctioned before long.†

The subjoined statement shows in detail the strength of the police establishment of Colaba, both stipendiary and unremunerated ‡:—

* Agent's letter in the Revenue Department, dated 31st July 1849, No. 512, and subsequent correspondence.

† Sanctioned, pending the introduction of the revenue survey, under which the haks of village officers are permanently settled.—*Ed.*

‡ Agent's letter to the Sudder Foudjaree Adawlut, dated 10th August 1848, No. 490.

STIPENDIARY.					UNREMITTERED.		
No. of each description.	Designation.	Amount of each person's pay per Mensem.	Total for 12 Months.	Grand Total.	Remarks.	No. of each description.	Designation.
	<i>District Police.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>			
2	Mamludars	125 0 0	3,000 0 0	3,000 0 0		190	Fauj-dars ..
	<i>Colaba Rangers.</i>						
1	Jemadar (commandant)	20 0 0	240 0 0		The Rangers are employed as guards over the hoozoor and district treasuries, the Colaba jail, and Rance's houses.		There are 150 inhabited villages; the extra Faujdars are in hamlets.
3	Havildars	10 0 0	360 0 0				
5	Naikes	8 0 0	480 0 0				
3	Drummers	8 0 0	288 0 0				
1	Fifer	7 0 0	84 0 0				
2	Standard-bearers	7 0 0	168 0 0				
69	Sepoys	6 0 0	4,968 0 0	6,588 0 0			
	<i>Colaba Police Peons.</i>						
1	Jemadar	8 8 0	102 0 0		<i>Chokers. No. of Peons.</i> Alibagh 11 Sattar 3 Tulowra 3 Sagurhur 1 Mandwa 2 Samierce Khind .. 5		
2	Havildars	6 8 0	156 0 0				
3	Naikes	5 4 0	189 0 0				
18	Sepoys	4 8 0	972 0 0				
1	Ditto	4 0 0	48 0 0	1,467 0 0			
				11,055 0 0	Total Colaba Police	25	

N. B.—122 revenue peons and 39 Tulatees are occasionally employed on police duties.

N. B.—Of the above 190 Faujdars 155 are Patels, and receive their share of the Patels' haks when their turn comes round; the rest receive nothing at all.

The Agent, who is also Magistrate, supervises the whole establishment. The Mamlutdars or district police officers have the immediate superintendence of the movements of the police in every case requiring its presence. The Colaba rangers are in fact stationary at Alibagh, with the exception of two detachments over the Poenar and Rewdunda treasuries. This corps is seldom called out to proceed to any part of the districts in pursuit of robbers: the work they have to perform partakes more of the nature of that done in other places by sepoy of the line. The discipline of this corps amounts to nothing more than being able to go through a few evolutions. The sepoys are wretchedly equipped in every respect: their arms and accoutrements are worn out, and their uniforms are in rags; and little has been done towards improving their appearance since the lapse, although they have been made a great deal more orderly of late by the introduction of young, well-behaved men, who have in the generality of cases been selected from the peons' establishment. This small corps was organized during the time of the late Chief Raghojee Angria, and was drilled up to the time of the lapse by two retired Native officers of the Honorable Company's army.

The next are the regular police, and these are the real "rangers," as their Native designation of "phirtee dowr" implies. They are divided into small parties, as shown in the column of remarks of the foregoing statement, and are stationed on the principal lines of roads, and at places known to be near the haunts of robbers. These peons are very useful as protection to travellers and the inhabitants in the neighbourhood of their chokees. They are sometimes called in by the village Foudars to aid them in pursuit of robbers, and they invariably accompany the district police officers while proceeding in search of thieves and stolen goods.

The N. B. under the head "Stipendiary" refers to all the peons and Tulatees or village accountants under the Mamlutdars, but out of the 119 peons and naigues, havildars and jemadars, 7 are employed exclusively on police duties: they are principally engaged in going about in the plantations of Cheol and Rewdunda, where the dwellings are so scattered that the people are of no protection to one another.

PART X.

MANUFACTURES.

This is a cultivating, and not at all a manufacturing district. Salt is the only article that supports a small portion of the population in its manufacture, leaving it independent of cultivation. The making of gold and silver ornaments,

and copper and brass household utensils, mostly to meet the demands within the district, also gives employment to the Sonars and Tambuts, who, it may be said, are the only artizans in the Agency; but the produce of their handicraft being on such a small scale, it will be unnecessary to enter into any details regarding it, as also in respect to the little oil expressed from the seeds of the oondce and kurrunj trees, and the teel by the Native ghanas or oil mills, which belong exclusively to the Beni-Israelites, who are the only Telees in the district. It therefore only remains that a description should be entered into regarding the manufacture of salt, which yields a considerable amount of revenue to Government, and at the same time gives employment to a good number of indigent cultivators.

A piece of land which is overflowed by the spring tides is selected, and embankments thrown up around it, sufficiently high to keep the salt water out, which is only allowed to flow in at stated periods, by means of flood-gates. About half of the land is set apart as a reservoir for storing up the salt water, and the other half is laid out into pans, which vary from 10 to 75 feet in length, and 5 to 8 in breadth. At spring tides the water is let into the large reservoirs (khujeenas), where it is allowed to remain from 15 to 25 days, in order to allow as much of the water to evaporate as possible; the remaining quantity is allowed to run into the pans, where it crystallizes in the course of 10 or 15 days. It is then scraped up, and collected in little heaps upon the sides of the pans, in order to allow it to dry before being removed to the larger heaps. The manufacture of salt continues throughout the whole period between March and the rains, in the course of which time five collections of salt are made. A beega contains from 25 to 40 pans, and produces 16 anas of salt in one season, an ana being equal to 72 Bengal maunds, the price of which, not including the amount of duty, which is paid at the rate of 12 annas per maund by the purchaser, is Rs. 108, being the total amount of returns to the proprietor. The amount expended in the first instance on a beega of land may be estimated at about Rs. 100, viz. Rs. 40 for the embankments, and Rs. 60 for levelling the land, and laying it out into pans.* A small sum is afterwards expended annually in putting the beds and embankments in order.

In the late Agent's report upon salt-pans, dated 24th June 1846, No. 174, Mr. Davies says, in the second paragraph, that "the ownership of the salt-works is about equally divided between Government and private proprietors, known under the appellation of Shillotrees. This may be gathered from the nearly equal proportion of land devoted by either party to this production, the Government pans occupying 73-8½ beegas of actual salt beds, not reckoning the extensive khujeenas or reservoirs set apart for the storing of sea water,

* I questioned a Shillotree about the cost, which he estimated at a much higher figure than I have put down. It is exceedingly difficult to get a correct statement from a Native regarding his field or his occupation.

and the private pans covering in like manner 81-17 beegas. The comparison is not equally to be relied upon with regard to the relative number of beds or oblong pits within the pans, as there is no standard of the area of these, and they differ widely in different salt-works."

A great deal of roguery is supposed to exist in the Government salt department, and most of the enormous quantity of salt that is written off the accounts every year under the heads of wastage and loss by floods is said to find its way surreptitiously into the market by the connivance and corruption of the Government officers in charge of the works; but this has received a great check in the uprooting during the last few years by the Revenue Commissioner of many of the Native officers who had long been carrying on a similar system of traffic in the neighbouring district of Sanksea, in the Tanna zillah.

The following shows in detail the establishment kept up by Government in the salt department in Colaba :—

Establishment kept up the whole Year round.

No.	Designations.						Cost per Annum.			Total.		
							Rs.	a.	p.	Rs.	a.	p.
1	Sir Karkoon*	..	..	..	..	..	360	0	0			
1	Ditto	..	..	..	..	..	240	0	0			
10	Karkoons ..	..	..	..	..	..	1,272	0	0			
2	Shroffs, at Rs. 8 each per mensem..	..	..	..	..	..	192	0	0			
1	Tolat ..	..	..	..	..	..	60	0	0			
	Peons establishment	..	..	..	..	..	2,238	0	0			
	Contingent expenses	..	..	..	..	..	240	0	0			
<i>Establishment kept up for Eight Months out of the Year.</i>							Cost per Eight Months.			4,602	0	0
2	Karkoons ..	..	..	..	..	..	144	0	0			
6	Tolats ..	..	..	..	..	..	240	0	0			
11	Peons ..	..	..	..	..	..	352	0	0			
2	Water-carriers	..	..	..	..	..	80	0	0			
										816	0	0
Total annual charge..							..			5,418	0	0

It will be seen on a reference to the table of exports that the average amount of revenue realized by Government during the last nine years ending 1849-50 is Rs. 35,970-0-3. The annexed is a diagram showing the annual amount of revenue derived from salt for thirty-four years, both under the Native and British Governments.

* The Sir Karkoons also get other allowances from the customs department.

PART XI.

HARBOURS, SHIPPING, AND COMMERCE.

Harbours, and Shipping frequenting them.—There are five bunders or harbours in this district, viz. those of Rewdunda, Alibagh, Thul, Mandwa, and Rewus. They are, with the exception of Mandwa and Rewus, much alike in every respect, being situated on creeks, and difficult of navigation, owing to the numerous sand-banks and rocks which lie hid at the entrances. The Rewdunda bunder is more commodious and easier of navigation than any of the rest, and is nicely protected by the hills to the south of the creek. The Alibagh and Thul bunders are the most difficult of navigation, and the former during the prevalence of strong westerly and south-westerly or northerly winds becomes exceedingly dangerous, even for the smaller craft. Both creeks become quite dry at low tide, and can only be ascended at half tide by vessels drawing about 25 candies. The Mandwa bunder is an open bay, and approaching to something like a small cove: the water is very low at half tide, and about a mile from the anchorage ground there are a few shoals, and a reef of rocks running out in the direction of the Caranjah hill, which with the strong current from the Nagotna creek makes the waves rise to a great height, and form a sort of bar during the rainy weather, making it rather formidable for navigation. Though the passage-boats have been crossing it nearly every day from time almost immemorial, no accident has, I believe, ever occurred; yet it would be dangerous for people unacquainted with the current to attempt to cross it in stormy weather. The small bunder of Rewus is situated high up one of the branches of the Nagotna creek, and can only be ascended between half and full tide. It is in other respects easy of navigation, and is the only bunder in Colaba which is provided with a jetty.*

The principal vessels which frequent these ports are much as from Bombay, for the purpose of taking cocoanuts, grain, dried fish, salt, and firewood to the Presidency. Larger vessels, called botellas, also come down from Jafferabad with cargoes of gram, wheat, tobacco, oil, ghee, and toor dhol. A number of small pattimars also frequent these ports, for the purpose of taking cargoes of batty rice and salt to the Southern Konkun.

Exports and Imports.—The information contained in the annexed tables was supplied to the Agent by the Assistant Collector of Continental Customs, greeably to forms sent to him to fill in for the special purpose of accompanying this report. It will be observed from Statement No. 1 that salt is the only

* The construction of two jetties, one on each side of the Nagotna river at Dhurumtur, was sanctioned in December last.—*Ed.*

considerable exportable produce of this district: the average amount of export duty paid upon it annually is Rs. 35,970-0-3. The great increase observable in the amount of duty paid in 1849-50 was owing to the supply in the large neighbouring pans of Penn in the Tanna zillah having become exhausted, and thereby increasing the demand upon those of Colaba.

The customs duty on all articles with the exception of that on salt having been abolished by Act VI. of 1848 will account for the columns for the years 1848-49 and 1849-50 in Statements Nos. 1 and 2 being partially blank; the figures that remain exhibited in those columns are mostly the amounts paid on articles of foreign bottom.

The sums shown in the columns for the year 1840-41 have been excluded from the averages, owing to Colaba having been under our rule for a portion of that year only.

The decrease in the export duty on liquor is owing to the insolvency of the principal manufacturer, a Parsee, who was obliged subsequently to abandon his vocation altogether.

Statement No. 3 shows the amount of anchorage fees charged upon all boats throughout the various ports of the Colaba Agency. The rates are considered high, and bear oppressively upon the smaller vessels of merchandize and passage-boats.* The levying of the fee upon the latter has only commenced very lately, and the people are making strenuous exertions for its abolition.

The rates of anchorage fees under Act I. of 1838 are as follow:—

				Anchorage Fees.	
From	10	to	20	Bengal candies	Rs. 1
"	20	"	40	"	1½
"	40	"	60	"	2
"	60	"	80	"	2½
"	80	"	100	"	3
"	100	"	150	"	3½
"	150	"	200	"	4
"	200	"	250	"	4½
"	250	"	300	"	5
"	300	"	350	"	5½
"	350	"	400	"	6

The following is a statement showing the amount of fees charged for registering all descriptions of boats during the last five years, under the provisions of Act. XIX. of 1838:—

* There is at present before the Supreme Government of India the draft of an Act for the abolition of these fees.—Ed.

No. 4.

Statement showing the Amount collected from Fees for Registering Boats of all descriptions, during the Five Years from 1845-46 to 1849-50.

Designation of Boats.	Amount in 1845-46.		Amount in 1846-47.		Amount in 1847-48.		Amount in 1848-49.		Amount in 1849-50.		Total for Nine Years, leaving out 1840-41.		Average for Nine Years, leaving out 1840-41.	
	Rs.	a. p.	Rs.	a. p.	Rs.	a. p.	Rs.	a. p.	Rs.	a. p.	Rs.	a. p.	Rs.	a. p.
Boats of Merchandize, and Fishing-boats, &c.	1,291	0 10	44	0 0	77	0 0	166	0 0	233	0 0	1,811	0 10	201	3 7
Total..	1,291	0 10	44	0 0	77	0 0	166	0 0	233	0 0	1,811	0 10	201	3 7

The rates of fees are as follows :—

1 to 20 Bombay candies.	Rs. 1
20 „ 100 „	5
100 „ 400 „	7
Two annas per each ton above 100 tons.	

The subjoined is a table of the establishment kept up by Government in the customs department for the collection of the revenue :—

Establishment kept up the whole Year round.

No.	Designation.	Cost per Annum.			Total.		
		Rs.	a.	p.	Rs.	a.	p.
2	Sir Karkoons, at Rs. 30 each per mensem ..	720	0	0			
9	Karkoons	1,200	0	0			
	Peons establishment	972	0	0			
	Contingent expenses	282	0	0			
<i>Establishment kept up for Eight Months out of the Year.</i>		Cost per Eight Months.			3,174	0	0
1	Karkoon	64	0	0			
1	Tolat	32	0	0			
9	Peons	288	0	0			
	Boat establishment	88	0	0			
Total annual charge					472	0	0
					3,646	0	0

Besides the above, the average amount of commission to the Sir Karkoons is Rs. 24 per month, or Rs. 288 per annum.

The whole is under the immediate superintendence of the Assistant Collector of Continental Customs and Excise, whose head quarters are at Oorun, in the island of Caranjah, which is a few miles to the north-east of Colaba.

PART XII.

MODES OF TRANSIT BY LAND AND WATER.

Modes of Transit and Communication by Land.—The products of the country and articles of merchandize during fair weather are brought by means of carts and biggaries from the different villages situated in the interior to the several bunders of Rewdunda, Alibagh, Thul, Mandwa, and Rewus, on the coast. On the other side of the hills, in the salt batty lands, goods are mostly shipped direct from the several little creeks which branch out from the Nagotna estuary. The communication with the bunders above-mentioned is materially affected by the total want of roads: there is not a yard of road in any direction outside the town and neighbourhood of Alibagh; and during the rains all

communication is cut off, except for people travelling on foot: no carts go across the country, although numbers of biggaries may be seen along the coast between Rewdunda and Mandwa, carrying for shipment to the market of Bombay the different products of the district, such as pan (betel leaves) and fruit, &c. from the bagayut, and fowls' eggs, &c. from the interior. The cost of transport from places situated at a distance from Rewus, Mandwa, and Thul, the only bunders from which passage-boats ply during the rainy season, is greatly enhanced from the want of roads. The inland route to Mandwa is not used in the monsoon, except by a few foot-passengers, and these have to wend their way over deep muddy rice embankments. The other route is by the beach, but here the creeks present great obstacles to the conveying of loads even by biggaries, owing to their not being fordable when the tide is in, and are only to be crossed in canoes at one pie per head; and one of these creeks (Awes) is even without this convenience.

The transport of articles by means of carts being thus unavailable for five months during the year, the products of the country must either remain unsold, or be carried to the bunder above-named on coolies' heads, at a great expense, unless disposed of in the district, where, from the smallness of the demand in comparison with the supply, remunerating prices are not to be obtained. This is quite sufficient to damp the energies of the Native cultivator, but would be easily remedied by a road from Rewdunda to Mandwa, with a small branch one to Rewus.

By Water.—All articles of merchandize, and the products of the country, after being taken to the bunders above detailed, are shipped for Bombay in the passage-boats which ply daily. This is a great convenience to people who do not carry on any extensive trade; and as the traffic between Bombay and this place consists chiefly of the export of grain, salt, and vegetable produce, and the import of a little tobacco, sugar, and a few other necessaries, the passage-boats afford all that is required as a means for their transport. A glance at the tables of export and import duty on these articles will show exactly to what extent this little trade is carried on.

On the Nagotna creek, private vessels are employed to take salt and grain, &c. to the Presidency: they are paid mostly by the trip, and sometimes contracts are entered into for stated periods.

The annexed statement shows in detail the rates of ferriage for all the bunders in the Agency.*

The rates are not considered high by the Natives, especially since they have been reduced; but there are a great many inconsistencies in the charges: for instance, for a candy of grain sent to Bombay from Rewdunda, a distance of 30 miles, the charge is Rs. 1-8-0, and for the same quantity sent by Thul, only 17 miles, Rs. 2; then, again, for Rewdunda the charge for taking a load

* Extract from statement, being accompaniment to Agent's letter dated 21st September 1849, No. 633.

of new cloth is 4 annas, and for Alibagh, which is 10 miles closer to Bombay, 8 annas. More will be said regarding this under the head of "Ferries."

Ferries.—There are seven passage-boat ferries which ply daily from this district—five to Bombay, one to Caranjah, and the other to Sace in the Tanna zillah. These passage-boats are let out every year by Government, who have the monopoly, and the farm of each ferry is put up separately, and afterwards in lump, and should the amount bid for the latter exceed the former, all the ferries are given to one contractor, *i. e.* the highest bidder; and the excess or decrease of each year is divided according to a proportion amongst all the ferries. The following* will show in a succinct form the amount derived by Government for each, for the last five years :—

From	To	Amount realized Annually from each Farm.				
		1845-46.	1846-47.	1847-48.	1848-49.	1849-50.
		<i>Rs.</i>	<i>Rs.</i>	<i>Rs.</i>	<i>Rs.</i>	<i>Rs.</i>
Rewdunda.....	Bombay	2,550	1,932	2,000	1,792	1,560
Alibagh.....	Ditto	2,050	1,553	1,350	1,214	1,060
Thul.....	Ditto	625	474	457	409	360
Mandwa	Ditto	3,125	2,641	2,285	2,050	1,785
Rewus	{ Ditto, Caran- jah, Sace.. }	1,750	1,400	1,713	1,535	1,335
	Total	10,100	8,000	7,805	7,000	6,100

The large amount bid for the contract for the year 1845-46 is owing to its having been made to extend over a period of fifteen months and twenty-five days, in order to accommodate the time of letting with that of the farm of the Tanna Collectorate. The decrease in the amounts bid for 1848-49 and 1849-50 is owing to a reduction having been made in the fares at Mandwa and Rewus.† The following is a list containing the rates of ferriage at the several bunders‡ :—

* Copy of accompaniment to Agent's letter to Government of 22nd May 1850, No. 358, in the General Department.

† Sanctioned in Government letter in the General Department, dated 21st January 1847, No. 142.

‡ Extract from statement, being accompaniment to the Agent's letter of 21st September 1849, No. 633.

Statement showing the Rates of Ferriage at the several Bunders.

Per	Rewdunda to Bombay, 30 miles.			Alibagh to Bombay, 21 miles.		Thul to Bombay, 17 miles.		Mandwa to Bombay, 10 miles.		Passage-boats starting from Rewus.		
	Rates.	Rates during Fair Season.		Rates during end of Rainy Season.		Rates during Fair Season.		Rates the same during Fair & Rainy Seasons.		Rewus to Bombay, 12 miles.	Rewus to Caranjah, 3 miles.	Rewus to Saee, 8 miles.
		Rates during Fair Season.		Rates during end of Rainy Season.		Rates during Fair Season.		Rates the same during Fair & Rainy Seasons.		Rates the same during Fair & Rainy Seasons.	Rates the same during Fair & Rainy Seasons.	Rates the same during Fair & Rainy Seasons.
	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>
Man or woman	0 4 8	0 4 8	0 5 4	0 5 4	0 4 8	0 5 4	0 2 0	0 2 0	0 2 0	0 2 0	0 2 0	0 2 0
Child	0 2 7	0 2 4	0 2 8	0 2 8	0 2 4	0 2 8	0 1 0	0 1 0	0 1 0	0 1 0	0 1 0	0 1 0
Bullock or cow	1 8 0	0 12 0	0 12 0	0 12 0	1 0 0	1 0 0	1 0 0	1 0 0	1 0 0	1 0 0	1 0 0	1 0 0
Calf or foal	1 to 2 as.	0 4 0	0 4 0	0 4 0	0 8 0	0 8 0	0 8 0	0 8 0	0 8 0	....	....	....
Horse or mare	....	1 14 0	1 14 0	1 14 0	2 0 0	2 0 0	2 0 0	2 0 0	2 0 0	....	....	....
Buffalo	....	1 8 0	1 8 0	2 0 0	2 0 0	2 0 0	1 0 0	1 0 0	1 0 0	....	....	....

Besides these, the passage-boat fares for articles of merchandize, &c. have been given in detail in the statement of charges for transport. It will be observed that the rates are not laid down according to any scale, but appear to have been left to the contractors themselves under the late Government: for instance, we find that the fare for a man at Rewdunda and Thul is the same, although there is a difference in the distance of about 13 miles. Another instance of this great inconsistency is in the rate charged for a horse: at Mandwa it is higher than at Alibagh, although the latter is more than twice the distance from Bombay. A great reduction and a remodelling of all the rates have been recommended by the present Agent for the sanction of Government, together with a suggestion for expending the proceeds of the contract in improving the means of communication throughout the district.*

It is not known exactly when these passage-boats first began to ply, but it is believed that they were only established within the last sixty years; the farming system has always been adhered to. Under the late Government the vessels were not under such strict superintendence as they are at present: they are now of a better description, and much more cleanly kept, and are altogether well adapted for the purpose to which they are applied. They are of a peculiar make, and very fast sailers. They are examined by committees every month, who report upon their state to the Agent; and if anything is wrong, the contractor is reprimanded or fined.

The traffic by means of these boats has not been on the decrease, and the passage communication with Bombay has of late been decidedly on the increase: both descriptions of communication would be much greater if a road were constructed from Rewdunda to Mandwa, as the Mandwa and Rewus passage-boats are the only ones that ply regularly during the rainy season. The one from Thul can only take advantage of the rare occurrence of breaks in the weather to run across the harbour.

Creek Ferries.—There are six creek ferries, and these are also let out every year on contract with the larger ferries. The rates are as follows†:—

Per	Rewdunda to Sal- wa in the Hub- shee's Terri- tory. (1)	Therowndé Creek Fer- ry. (2)	Alibagh to Akshee. (3)	Wursolee Creek Fer- ry. (4)	Thul Creek Ferry. (5)	Dhurumtur Ferry. (6)
	<i>As.</i> <i>p.</i>	<i>As.</i> <i>p.</i>	<i>As.</i> <i>p.</i>	<i>As.</i> <i>p.</i>	<i>As.</i> <i>p.</i>	<i>As.</i> <i>p.</i>
Individual .. {	Large boat. 0 2 Canoe.. .. 0 5	} 0 1	0 1	0 1	0 1	0 3
Load .. ..	....				
Horse .. ..	....	....	....	....	....	0 3
Bullock or buffalo.	....	....	....	....	....	4 0
Ass .. ..	....	....	....	....	....	2 0
Goat .. ..	....	....	....	....	....	1 0
						0 6

* Since the compilation of this Report, the ferry rates throughout the Presidency have been very generally remodelled, and the surplus proceeds are now everywhere devoted to the improvement of the communications connected immediately or remotely with the ferry.—*Ed.*

† Extract from statement, being accompaniment to Agent's letter of 31st September 1849, No. 633.

Ferries Nos. 2, 3, 4, and 5 are fordable at low tide. Ferry No. 1 plies across the Rewdunda creek; a small boat and canoe are kept up the whole year round by the contractor. Ferry No. 6 plies across the rapid stream of the Nagotna estuary; a small boat and a canoe are kept constantly going to and fro, as this is in the direction of the main road into the Deccan. The approach to this ferry is over rice embankments, and for five months in the year people passing over them are obliged to walk for a mile or two up to their knees in mud. It has been recommended that a road be made across this part.*

PART XIII.

BANKING OPERATIONS, &c.

Banking Operations.—There is only one banking house in the Agency, which belongs to the ex-Dewan Venaik Purushram, who was sole minister, banker, and money-lender under the late State. The business is, however, not very extensive, owing to Alibagh not being situated on any line of traffic where commercial transactions are carried on to any extent. The following information was supplied me with the assent of the proprietor by a person connected with the establishment.

Bills of exchange can only be had in Alibagh upon the houses in Bombay, Poona, and Benares. The rates of commission are as follows :—

Bombay.—From November to May, quarter per cent. ; from June to October, half per cent.

Poona.—One per cent.

Benares.—Two to three per cent.

Commission is not charged according to the number of coss, as in some other places. It is seldom that drafts are given for larger sums than Rs. 5,000, but in emergent cases, when the rate of commission offered is favourable, a hoondet† may be obtained for a sum as far as Rs. 25,000. It is estimated that the monetary transactions on bills of exchange do not amount to more than Rs. 15,000 per annum.

This banking house has a few loan transactions with the higher classes of people in Colaba and the surrounding districts, of respectability, and possessing estates; the rates are as follows :—

Without mortgage.....	Rs. 6 12 0 per cent. per annum.
With mortgage.....	Rs. 6 0 0 ditto ditto.

* Vide Agent's letter of 21st September 1849, No. 633.

† The Mahratta term for bill of exchange.

No amount above Rs. 25,000 can be obtained on loan. The transactions of this description average about Rs. 50,000 per annum. The branch establishments of Bombay, Poona, and Benares carry on a very extensive business.

Lending and Borrowing.—There is only one Soucar in Colaba possessing capital amounting to some lakhs,* and that is the ex-Dewan,* but he has no dealings with the mass of the cultivators, who are the principal borrowers in the Agency. There are only three Soucars possessing as far as Rs. 25,000 each, three as far as Rs. 10,000, about six Rs. 5,000, and about twenty or twenty-five between Rs. 400 and Rs. 4,000; the rest are petty usurers, composed chiefly of Marwarees and Goozurs, who may be found nearly in every village in the district.

Table showing the usual Rates of Interest charged, and the mode of lending Money.

Classes.	Rates, Conditions, and Penalties.	Per Cent. per Annum.
I.—To respectable persons, possessing property.	With pawn ... { 10 as. per cent. per mensem .. { 12 as. ditto ditto... .. Without pawn. { Rs. 1 ditto ditto... .. { 1 pice (sewraee) per Rupee do. 1 dirkee (3 pies) per Rupee per mensem By giving Rs. 10, and taking a bond for Rs. 12, thus in a manner securing the interest beforehand; the principal is then recovered at the rate of Rs. 1 per month, and the whole within the year	Rs. a. p. 7 8 0 9 0 0 12 0 0 15 0 0 18 12 0
II.—To respectable persons of the middle classes, possessing small estates.	2 pice (sewraees) per Rupee per month 25 per cent. per annum 2 dirkees (6 pies) per Rupee per mensem $\frac{1}{2}$ maund batty per Rupee per annum 2 maunds ditto ditto ditto	36 0 0 25 0 0 37 8 0 40 0 0 60 0 0
III.—To cultivators and others, whose ability to pay off the loan is doubtful.	1 anna per Rupee per mensem... .. 2½ maunds batty per Rupee per annum 3 maunds ditto ditto ditto Or penalty, if not paid within the prescribed time, Rs. 1 per each maund	75 0 0 100 0 0 110 0 0 200 0 0

The two first classes of rates appear to be reasonable, although a few of them are rather too high ; but in Class III. is comprised the most exorbitant rates of interest that are perhaps to be found in any part of the known world, and it is not surprising that under such a system the ryots are fast becoming a race of paupers ; in fact their poverty even now is most abject. The manner in which the Regulations allow of the fields, houses, cattle, and household utensils of debtors to be sold in execution of the decrees of the Civil Courts is excessively oppressive on the agricultural ryots. Once involved with a

[†] This was written some months before his death.

Soucar, the debt is handed down from generation to generation, and the only means left to a debtor to prevent him from actual starvation is by becoming the bond-slave of his creditor, who, as in most cases, is some grasping Marwaree, who pays the voluntary slave for his services Rs. 5 per annum besides his food (Rs. 14-8-0), a cumlie (14 annas), a pair of shoes (8 annas), two pieces of cloth (2 annas), tobacco (4 annas), and barber (2 annas), making in all Rs. 21-6-0, or Rs. 1-12-0 per mensem.

But, as already stated at length in page 63, the ryots have themselves only to blame for the misery they incur in rashly contracting large debts for marriages and other ceremonies. They are, moreover, exceedingly improvident of the money they procure with such hardship and trouble, squandering it in drink, feasts, and other foolish vices. It does not appear how the Government can ameliorate their condition even by legislative enactment, though some provision is absolutely necessary to prevent the cultivators from falling so inextricably into the hands of the greedy Soucars.

PART XIV.

WEIGHTS AND MEASURES, AND COINS.

Weights and Measures.—The weights and measures in this district have not been regulated according to any fixed standard, and they not only vary in every different village, but those in the same village very often disagree to a very material extent. Some attempts have, however, been made to introduce an uniform scale throughout the Agency; but as such reformatations can only be effected properly when the subordinate Native officers are made to take an interest in promoting them, it is not to be wondered at that the weights and measures of Colaba are still so diversified after being so long under British rule.* The following are the tables of the weights and measures which are in general use, and considered to be the standards of the country. The goldsmiths' weights are exempted from the above remarks :—

* The Mamlutdar of Rewdunda, Gopal Narayan, has since his appointment made some attempts to introduce an uniform standard in his district, and there is every likelihood of his praiseworthy endeavours meeting with success.

Goldsmiths' Weights.

Oodeed.		1 Goonj. Wal.		1 Pow Massa.	
2 =		2 =	1 =		
4 =		4 =	2 =	2 =	1 Arda Massa.
8 =		8 =	4 =	4 =	2 = 1 Massa.
16 =		16 =	8 =	8 =	4 = 2 = 1 Done Massa.
32 =		32 =	24 =	12 =	3 = 1½ = 1 Teen Massa.
48 =		48 =	48 =	24 =	6 = 3 = 1½ = 1 Sa Massa.
96 =		96 =	96 =	48 =	12 = 6 = 4 = 2 = 1 Tola.
150 =		150 =	192 =	96 =	24 = 12 = 8 = 4 = 2 = 1 Done Tola.
360 =		360 =	384 =	192 =	24 = 16 = 8 = 4 = 2 = 1 Char Tola.
720 =		720 =	576 =	288 =	36 = 24 = 12 = 6 = 3 = 1½ = 1 Sa Tola or Pow Seer
1,080 =		1,152 =	576 =	576 =	72 = 48 = 24 = 12 = 6 = 3 = 2 = 1 Ad Seeree.
2,160 =		2,304 =	1,152 =	1,152 =	144 = 96 = 48 = 24 = 12 = 6 = 4 = 2 = 1 Seer.
4,320 =		4,608 =	2,304 =	2,304 =	

The corresponding weight in grains Troy is given opposite each of the Native weights, commencing with the massa.

Weights by which Sundry Goods are bought and sold.

Now Taken.	2 =	1 Pow Seer.				
	4 =	2 =	1 Ad Seer.			
	8 =	4 =	2 =	1 Seer.		
	16 =	8 =	4 =	2 =	1 Done Seeree.	
	20 =	10 =	5 =	2½ =	1½ =	1 Adeech Seeree.
	40 =	20 =	10 =	5 =	2½ =	2 =
						1 Pach Seeree.
	80 =	40 =	20 =	10 =	5 =	4 =
						2 =
	160 =	80 =	40 =	20 =	10 =	8 =
						4 =
	320 =	160 =	80 =	40 =	20 =	16 =
						8 =
	640 =	320 =	160 =	80 =	40 =	32 =
						16 =
	800 =	400 =	200 =	100 =	50 =	40 =
						20 =
	1,600 =	800 =	400 =	200 =	100 =	80 =
						40 =
						20 =
						10 =
						5 =
						2½ =
						2 =
						1 Pach Munka.
						1 Doo Munka.
						1 Adeech Munka.
						2 =
						1 Pach Munka.

Two now-takees are equal to 1,260 grains Troy, or 7 tolas, and the corresponding weight in Avoirdupois of one seer is drs. 183.717. Tobacco, brass, copper, iron, lead, &c. and ghee, dry cocoanut, sugar, jagree, molasses, oil, vegetables, and tamarind, &c. are bought and retailed by this weight.

It is strange that there is a separate weight called chouth for butter, and it can only be accounted for from the fact of its being the only commodity of the kind which is bought direct from the Gowlees and cultivators by the shopkeepers ; but after its conversion into ghee it is retailed according to the foregoing weights. A chouth is equal to 42 tolas, or $1\frac{1}{2}$ seers, or about 17 ounces Avoirdupois.

The only uniform weights in the district besides the goldsmiths' are those used in the Government salt department, which were introduced since the lapse for the sale of salt out of the pans ; but in its retail by the shopkeepers the measure of capacity is used.

Weights in the Government Salt Department (Bengal).

Grains.	1 Now Takee.	1 Pow Seer.	1 Ad Seer.	1 Ser.	1 Done Seeree.	1 Adeech Seeree.	1 Pach Seeree.	1 Dha Seeree.	1 Ad Munka.	1 Munka.	1 Doo Munka.	1 Adeech Munka.	1 Pach Munka.	1 Dha Munka.
1,800 =	2 =	4 =	8 =	16 =	20 =	40 =	80 =	160 =	320 =	640 =	800 =	1,600 =	2 =	2 =
3,600 =	4 =	8 =	16 =	32 =	40 =	80 =	160 =	320 =	640 =	1,280 =	2,560 =	5,120 =	4 =	4 =
7,200 =	8 =	16 =	32 =	64 =	80 =	160 =	320 =	640 =	1,280 =	2,560 =	5,120 =	10,240 =	8 =	8 =
14,400 =	16 =	32 =	64 =	128 =	160 =	320 =	640 =	1,280 =	2,560 =	5,120 =	10,240 =	20,480 =	16 =	16 =
	20 =	40 =	80 =	160 =	200 =	400 =	800 =	1,600 =	3,200 =	6,400 =	12,800 =	25,600 =	20 =	20 =
	40 =	80 =	160 =	320 =	400 =	800 =	1,600 =	3,200 =	6,400 =	12,800 =	25,600 =	51,200 =	40 =	40 =
	80 =	160 =	320 =	640 =	800 =	1,600 =	3,200 =	6,400 =	12,800 =	25,600 =	51,200 =	102,400 =	80 =	80 =
	160 =	320 =	640 =	1,280 =	1,600 =	3,200 =	6,400 =	12,800 =	25,600 =	51,200 =	102,400 =	204,800 =	160 =	160 =
	320 =	640 =	1,280 =	2,560 =	3,200 =	6,400 =	12,800 =	25,600 =	51,200 =	102,400 =	204,800 =	409,600 =	320 =	320 =
	640 =	1,280 =	2,560 =	5,120 =	6,400 =	12,800 =	25,600 =	51,200 =	102,400 =	204,800 =	409,600 =	819,200 =	640 =	640 =
	1,280 =	2,560 =	5,120 =	10,240 =	12,800 =	25,600 =	51,200 =	102,400 =	204,800 =	409,600 =	819,200 =	1,638,400 =	1,280 =	1,280 =

The equivalent in grains Troy has been given according to the scale in use at the custom house at Alibagh.

The Khutrees of Rewdunda sell their silks by the ose, which is equal to 2½ tolas, or 450 grains, which is 30 grains less than 1 oz. Troy. The ose as a weight must have been adopted from the Portuguese, whose subjects the Khutrees for a long time were.*

Measure of Capacity.

The dry measure is alike in all parts of the district, but none of them have been stamped, as in other places which have been longer under British rule.

Dry Measure.

Tepree.

2 = 1 Neitwa.

8 = 4 = 1 Adholee.

96 = 48 = 12 = 1 Ad Munka Phura.

192 = 96 = 24 = 2 = 1 Munka Phura.

This measure is used in buying and selling grain, salt, chunam, seeds, and small dried fish. The phura is a square box, with handles on either side, and when used is struck off even with the edges of the measure with a run by a rod made for the purpose.

In the rest of the measures the grain is heaped up above the sides.

The liquid measures are used for milk and liquor, and are made of copper or brass.

Liquid Measure.

1 Pow Seer.

2 = 1 Ad Seer.

4 = 2 = 1 Seer.

20 = 10 = 5 = 1 Pach Seer.

The pach seer measure is only used for liquor. In the custom house, duty is charged on spirits according to the imperial gallon, which is equal to five quarts according to Schedule A of Act I. of 1838.

The square and long measures are uniform throughout the district. In a few places in the interior not visited by Europeans, and where most of the dealings are carried on with poor ignorant ryots, the cloth measures vary, owing to the crickery of the shopkeepers.

Land Measure (Square).

Sq. ft. In.

87 1½ = 1 Kathce.

1,762 2½ = 20 = 1 Pand.

34,844½ 0 = 400 = 20 = 1 Beega.

43,560 0 = 500 = 25 = 1¼ = 1 Acre.

The Portuguese word for ounce is onca.

The kathee is the only measure used in the survey of land, and is 9 feet 4 inches in length.* The acre has only just been introduced in the survey of the salt batty lands of the Oonderee talooka, as also two other measures, viz. the goonta and ana: the former is equal to one-tenth of an English rood, or 1,089 square feet, and there are 16 anas in a goonta, and 40 goontas in an acre.

The tussoo, hath, and guz are the long measures used by the shopkeepers in the sale of the common country cloth: those of European manufacture are chiefly sold by the English yard, which is equal to 24 tussoos, so that there are 8 tussoos in a foot. The hath of 14 tussoos is also used to some extent in the measuring of cloths of country produce. The guz is exactly equal to 18 tussoos, or 2 feet 3 inches, so that a tussoo is equal to one inch and a half; however, there is no regular standard of the tussoo, and so it is difficult to say exactly what it is equal to. The sawyer's guz is of a different size, and is 24 tussoos in length, i.e. about 2 feet 8 inches.

Coins.—The only coins that were struck by the Angria Government are the Joona Alibaghee and Nowa Alibaghee rupees, and the Alibaghee copper pice. The Joona or old Alibaghee rupee was the first in circulation, and bears a Persian inscription; the Nowa or new Alibaghee rupee has nothing more than the compound Mahratta letter (श्री) shree on both sides, with a small drilled hole. The following is an extract from the assay tables of the Bombay Mint Assay Office, dated respectively the 31st December 1842 and 27th March 1850:—

Vide Agent's letter to the Revenue Commissioner of 23rd January 1846. No. 17

Extract from Assay Tables of the Bombay Mint Assay Office.

Names of Coins.	Average										Value of 100 in the new Bombay Currency.	
	Weight.			Touch.			Pure Metal.				In 1842.	In 1850.
	In 1842.		In 1850.	In 1842.		In 1850.	In 1842.		In 1850.			
	Grs. Decls.	Grs. Decls.	Grs. Decls.	Per ct. Decls.	Per ct. Decls.	Per ct. Decls.	Grs. Decls.	Grs. Decls.	Grs. Decls.	Grs. Decls.	Rs. Decls.	Rs. Decls.
Colaba Alibagh Rupee	171 64	170 96		84 75	84 42		145 464	144 324			88 160	87 469
Zunjeera Colaba Rupee	171 36	171 36		78 25	78 25		134 089	134 089			81 266	81 266

The Colaba or Alibaghee rupee is the "Joona Sicca," and the Zunjeera Colaba is the "Nowa," and the reason of the issuing of the new money is owing to the Honorable Company having some years ago interdicted the petty Native chieftains from coining, and the late ex-Dewan, to avoid this inconvenience, obtained permission to issue within the territories a silver coin of inferior value, which had the effect of confining its circulation to the district. The Alibaghee pice, although issued from Angria's mint, bears the stamp of Shree Raja Chutruputtee (श्री राजा चवपती) or the King of Sattara, who was Angria's liege lord. The only coins now in circulation are those of the Honorable Company and the Alibaghee pice.

PART XV.

POSTAL ARRANGEMENTS.

There is only one dawk in the Agency, viz. the one to Penn, situated in the Tanna zillah. Official as well as private letters are sent by this channel to Penn, from whence they are forwarded to their several destinations. Besides the established postage rates of the Bombay Presidency, there is a separate sum charged on private letters as "Penn postage," which is according to the following scale :—

Not exceeding $\frac{1}{4}$ tola, 6 pices.

Above $\frac{1}{4}$ tola, and not exceeding 1 tola, 1 anna.

This is considered by the Natives to be a great hardship; and in one way their dissatisfaction is not unreasonable, as no separate dawk runners are kept up, and the distance being only about 22 miles, some reduction might be made, or it could very well be done away with altogether. Private letters to Bombay are also sent by this channel, and they seldom reach their destination under 48 hours, and are even sometimes, during the rainy weather, four and five days on their way; but merchants and people of business in general avoid this long route, and send their letters by the passage-boats under the care of one of the Kolees, who receives now and then a little recompense for his trouble.

The amount of the postal revenue collected in Alibagh, which is very small, is not credited to Colaba, but is taken by the Tanna zillah, and forms an item of the Penn Post Office revenue.

No separate establishment is kept up for this post. The dawk letters are carried by peons belonging to the establishments of the Agent and Mam-lutdar.

There are five peons detached for the special duty of conveying letters between Government and the Agent. The letters are sent to Bombay *viâ* Mandwa, and those for the Agent come generally by the Alibagh passage-boat during fair weather, and in the monsoon by Mandwa or Rewus.

PART XVI.

ANTIQUITIES.

The best locality in this district for antiquarian research is about Cheol and Rewdunda. The former, as before mentioned, was once a very large commercial city, and, according to legendary lore, it was even superior to Surat in its palmiest days. Rewdunda is exceedingly interesting, from the numerous Portuguese ruins which are to be seen scattered over the whole space to the west of Cheol.

The fort itself, which is about a mile in circumference, contains a vast number of ruins of chapels, monasteries, inquisition rooms, and other public buildings. The histories of the several places have been left on the walls, for inscriptions meet the eye in every direction, though many of them are now nearly illegible.

Though the forts of Rewdunda and Koorla are in the Tanna zillah, I could not refrain from touching upon their histories, as they are so intermixed with those of Colaba that I could not well separate them. The fortifications of Koorla, on the other side of the creek, contain vestiges of Mahomedan buildings. The walls are in a very perfect state, and being situated on a hill, the fort will be standing quite perfect when not a vestige of Rewdunda may remain, owing to the encroachments of the sea.

I was a long time engaged in copying all the inscriptions of the fort of Rewdunda, and I think I may state that none have escaped me; while I have contented myself with only giving a copy of the principal one in Koorla.

The annexed is a drawing of an ornamental fragment of a Jain temple which is supposed to have existed in Cheol many years ago. It was found by me in Cheol under a Banian tree, as also a few other pieces. The marble and workmanship (which is exquisite) are, as I am informed by the Rev. Dr. Wilson, both of Rajpootana origin. The most prominent figures are the Tirthakars or Tirthankars, or "men who are supposed to have obtained *nirran*, emancipation from material embodiments and impediments, by their study and contemplation."^{*}

^{*} Rev. Dr. Wilson's "Evangelization of India"

This piece of sculptured marble has been presented by me to the Honorable Company's museum.*

The Portuguese inscriptions, &c. are mostly arranged according to their dates, and I have again to acknowledge the kindness of Mr. N. Fernandez in furnishing me with translations of many of them.

The first inscription alluded to the building of the fort some time after the erection of the factory.

No. 3 is a drawing of the gateway of the factory, which will give an idea of the architecture of the buildings in this fort. The greater part of the walls of these edifices are remarkable for their want of thickness. This gateway was erected about the year 1521 by Ferdinando Camelo, who obtained permission from the King of Ahmednuggur for the construction of the factory.† The figures of the guardian saints St. Peter and St. Paul occupy conspicuous positions over the entrance, but they have been sadly disfigured by the Natives.

No. 4 is the figure of a warrior in a coat of mail, no doubt intended to represent one of the Kings of Portugal, perhaps King Sebastian, who was, about the time that the fortification was made, on the throne of Portugal : but João is distinct enough—it may therefore have been intended for one of the Johns. The stone on which the figure is cut out (in high relief) is let into the outer part of the fortification to the right hand side of the southern gateway. It is completely hid from view by the erection of a Hindoo altar to the toolsee ; and it was with some difficulty that I could make out some of the letters at the foot of the figure. It will be observed, that the hands and face have been completely destroyed ; no doubt by some zealous Mahomedans, for it appears that the Hindoos of the lower class have mistaken it for Mahadeo, and they sometimes worship it as such.

The different sizes of each of the inscriptions are given on each copy in feet and inches.

No. 5 is copy of a stone engraving now lying in the Agent's bungalow : it was brought from Rewdunda about eight years ago, as also another very large one, marked No. 10.

Nos. 6 and 7 are over the southern gateway.

On the other side of this gateway is the coat of arms of Portugal, with a globe on one side, and three arrows on the other, and a cross above it. They are most beautifully cut out on black stone, and are as perfect as when they were let into the wall.

The globe I suppose denotes power ; the broad belt which encircles the whole I opine was intended to show the Portuguese acquisitions throughout the world.‡ The copy was very carefully made by me, and the whole was

* Vide Government letter in the General Department, dated 8th March 1851, No. 1016.

† Faria y Souza.

‡ It may also have been intended for the Zodiac.

done by actual measurement. The three arrows tied together denote peace, for the Portuguese in Cheol had previous to this, for a long period of thirty years, enjoyed an uninterrupted quiet.

No. 9 is copy of a very interesting tablet of white marble to the memory of the famous Jesuit Francisco Xavier, who visited Cheol on his way up to the Northern Konkun.

The chapel here alluded to is of very small dimensions, perhaps not larger than a good sized vestry room. This tablet, which will no doubt disappear before long, if left in its present place, as the Natives are allowed to do whatever they like with the ruins, ought to be removed to some public place where it would be better cared for. Indeed it would not be unfit for a space in a museum.

No. 10 belonged to a convent. The stone is now laying in the Agent's bungalow, but from what building it was taken I have been unable to discover. There is now standing on the south-west side of the fort a very lightly constructed edifice, with numerous arches, which was probably used as a convent; and from an aperture in the wall agreeing in size with the stone, I am under the impression that this is the place alluded to in the inscription.

There are not near so many inscriptions in the fort of Bassein as there are in Rewdunda, and the small fortification of Koorla; in the latter place even each bastion has its respective name cut in it, as—

S. PEDRO

S. FELLIPPE

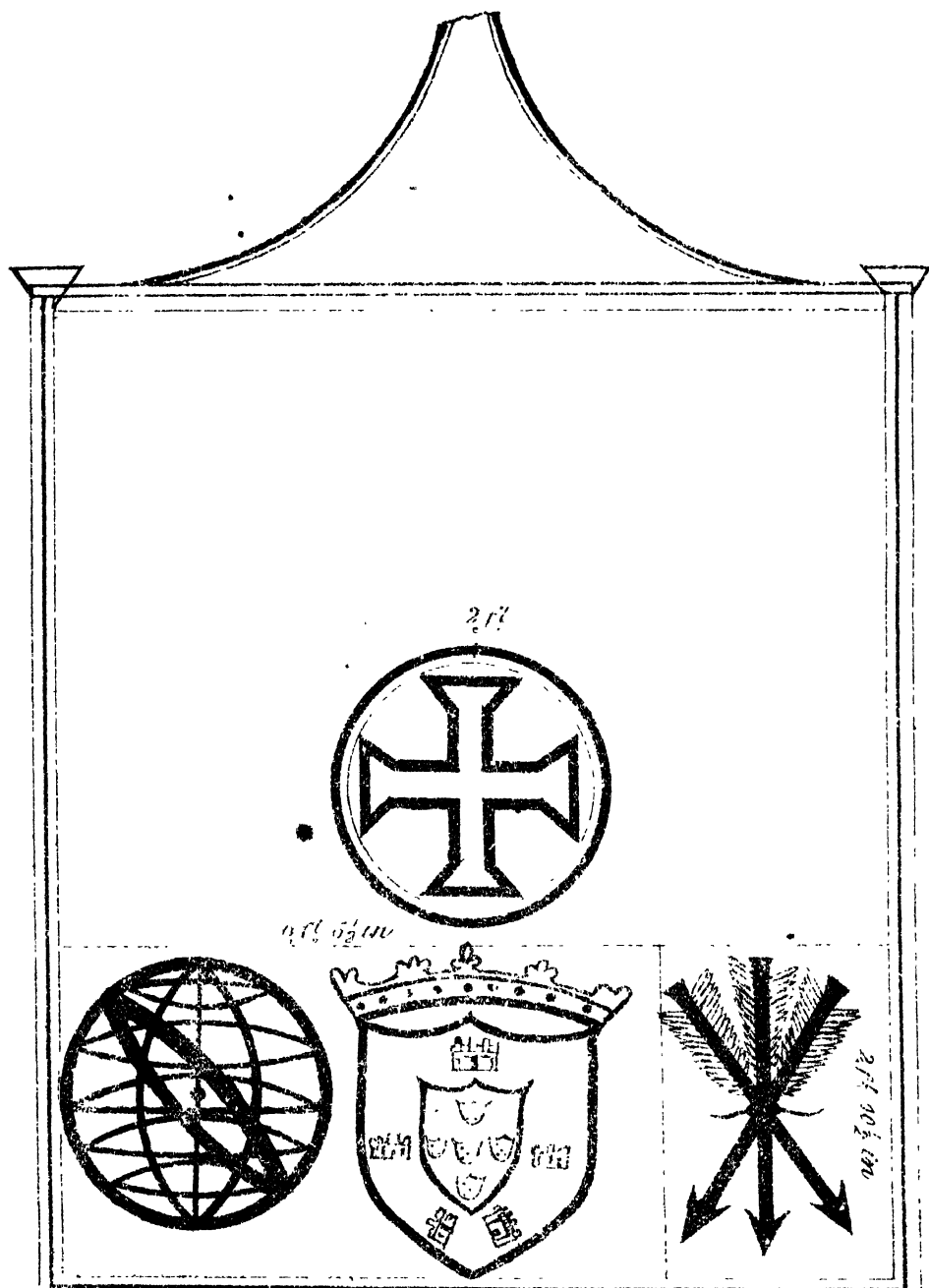
No. 11 is copy of an inscription over a doorway in the centre of the fort of Koorla, which gives an account of the erection of the fortification.

There are two or three more: one is situated over the principal entrance, and another over an altar in a small chapel; but they are hardly legible, and it would require some time and trouble to decipher them.

I had not time to send this over to get a translation; I have, however, with the assistance of a Portuguese dictionary, been able to give the substance of it.

The next inscription is that on a round tower, belonging to the wall which surrounds the town of Rewdunda. There are four embrasures on this tower, and it has rooms for a guard of about twenty-five soldiers. From this tower the Portuguese cannon could sweep the whole plain outside the walls.

No. 13 is copy of an inscription which was near the eastern doorway of the wall round the town of Rewdunda. The stone is now in the possession of the medical officer at Alibagh. I could not procure a translation of the inscription, although I sent copies of it to two or three professed Portuguese scholars. The substance of the inscription has been supplied.



**SELECTIONS FROM THE RECORDS OF THE BOMBAY
GOVERNMENT.**

No. IX.—NEW SERIES.

**BOMBAY,
BARODA, AND CENTRAL INDIA
RAILWAY.**

B o m b a y :
PRINTED FOR GOVERNMENT
AT THE
BOMBAY EDUCATION SOCIETY'S PRESS.

1855.

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THE BOMBAY, BARODA, AND CENTRAL INDIA RAILWAY.

To H. E. GOLDSMID, Esq.,
Secretary, Financial Department, Bombay.

Bombay, 28th April 1854.

SIR,

I have the honour to forward herewith, for submission to the Government of Bombay, a Report, with Appendix and Sections, in reference to the project of the Bombay, Baroda, and Central India Railway Company.

I have the honour to be, &c.

(Signed) J. P. KENNEDY, Lieutenant Colonel,
Managing Director, and Engineer in Chief.

TO THE DIRECTORS OF THE BOMBAY, BARODA, AND
CENTRAL INDIA RAILWAY COMPANY.

REPORT BY LIEUTENANT COLONEL J. P. KENNEDY,
Managing Director, and Engineer in Chief, Surat.

1. On the 10th of August 1853, the Directors of this Company were authorised by the Honorable the Court of Directors of the East India Company to execute a survey of their projected line of railway. I was immediately commissioned to employ the requisite officers for this duty, and upon the 20th of September, within forty days of the date of the authority, the first surveying party of nine engineers left England by the overland route for Bombay. The officer in charge was furnished with general instructions (Appendix No. I.) for their guidance, and

their number was increased by the following mails to thirteen. Each gentleman, on his arrival in India, proceeded without delay to execute the work laid down for him.

2. I followed the surveying parties to India, arrived at Bombay on the 9th of January last, and found that the work had been steadily progressing in the several districts from the commencement of the cold season in November.

3. The objects of our project, as set forth in our memorial to the Honorable the Court of Directors, was to open the most effectual general line of intercourse from Bombay, the great western capital and seaport of India, through the central and north-western districts, to meet the railway in progress of construction from Calcutta to Delhi, together with all the branches that such a line could require. We proposed to adopt the best levels which the general structure of the country would admit, and to pass through those great obligatory points which shall afford the most convenient junctions for branches to meet the broadest mercantile requirements of all adjacent and remote districts.

4. If we cannot show, by the strictest mathematical proofs, that our project contains these indispensable essentials in the highest possible degree of which the features of the country will admit, we shall claim for it no consideration on any minor grounds.

If, however, it shall appear that the produce of every district of Central and North-western India, to which our line and its branches are proposed to extend, shall be brought by us on the shortest and levellest lines to their respective markets, and to the nearest ports for embarkation, it may fairly be affirmed that the above indispensable essentials are secured, and that what we propose is worthy of execution—that it must, in fact, be preferable to any other project which essentially differs from it, having the same objects in view.

5. If the map be referred to, it will be quite apparent—

That the sea close to Baroda, Broach, and Surat, is the nearest to all the districts of Central India north of the Taptee basin inclusive ;

That our lines from the sea near Baroda, Broach, and Surat, diverge inland by the shortest courses, and at the most gradual inclines, that can be obtained ;

That whatever harbours, therefore, now exist in that favourable position, or may hereafter be procured by artificial means, are secured by our project for the export and import traffic of the vast districts to which it refers ;

That our project therefore reduces, by about 200 miles of land journey, the distance which goods from all those districts must necessarily travel to reach a port by any other course than that which our project lays down ;

That even considering Bombay as the only commercial point of importance, and overlooking for a moment all the advantages we possess from intermediate ports, good gradients, &c., our project offers a much shorter approach to Bombay itself, from all those districts through which our main line runs, and from all districts to the westward of our main line, and from districts situated considerably to the eastward of our main line after it reaches the Taptee basin, than any project can do going over the Sahyadree Ghauts ;

That it offers as short a communication as any line that can be proposed between Bombay and Indore, the latter being the point to which the various lines of traffic of Central India at present converge, and that our line from Indore to Bombay will be free from those glaring and costly impediments which every line passing over the Ghauts must be exposed to, and also that our line gives to the Indore traffic an intermediate port, which will save 200 miles of land freight as compared with any line over the Ghauts to Bombay ;

That our project opens a communication from Bombay by the best possible lines with the territories of the Northern Konkun, Surat, Broach, Guzerat, Khandeish, Rajpootana, Malwa, Scinde, the Punjaub, Peshawur, and the North-west Provinces, all of which any line over the Sahyadree Ghauts must either wholly neglect, or enter at enormous disadvantages, both in respect to distance and gradients ; and that the only district which a line over the Ghauts can benefit, and which ours cannot, would be the Deccan ;

That whatever benefit a line over the Sahyadree Ghauts may offer to a portion of Berar in regard to direct distance from Bombay, is more than neutralized by the superiority of our gradients, and the still nearer intermediate port of Surat, which our project would offer to both Berar and Khandeish ;

That if it be desirable to connect our project in an easterly* direction with the Calcutta line, we can effect that object without any important sacrifice of distance, and without any of the grave defects in gradients which a line passing over the Ghauts must necessarily present : our project is therefore mathematically correct, and has advantages in reference to general traffic which no other, differing essentially from it, can have.

6. It has, however, been asserted by some, that there are two grave impediments to the execution of our project, viz :—

1st.—That the broad estuaries close to the sea, and spurs coming down from the Sahyadree range, must be crossed, which would render it a very difficult undertaking.

2nd.—That the opening of our line through the Taptee Valley, an essential portion of our project, would be opposed by nearly impassable nullas.

In reply, I have only to say that I have just visited both these districts, and the objections are utterly groundless, as the sections will show,

1st.—There are no spurs from the Sahyadree range to pass over.

2nd.—We do not propose—nor would it be advisable, if practicable—to cross the estuaries close to the coast. We propose to cross the rivers, with few exceptions, inland, where they are easily dealt with, and where the various points of our line will be the centres of productive circles of traffic, instead of semi-circles. The interests of the Northern Konkan are well worthy of this consideration.

3rd.—We do not propose to cross the nullas of the Taptee Valley close to the river, where those nullas are formidable, but in the great central line of the more level district south of the river, where the chief commercial and industrial activity exists; where the banks of the nullas are low, their beds and sides solid, and where the surface of the country is in every way favourable for railway construction. The Taptee Valley in its whole length is much the easiest portion of our entire project, with the exception of the flat ground about Broach, Baroda, and Salsette.

7. Those who desire to become acquainted with this district would do well to consult Captain Wingate's admirable report upon Khandesh, made preliminary to the commencement of the revenue survey there. They will find it is not a district to be neglected, but one possessing vast capabilities; and no unprejudiced engineer who had ever visited that country would venture to assert that it presents any difficulties to the establishment of the most perfect line of railway.

8. It is far from my intention to undervalue the obstacles that rivers and nullas are likely to oppose to Indian railway construction; all that I maintain is, that the rivers and nullas in these districts are like the rivers and nullas in other districts of India, and that the engineer who is not prepared to deal with such obstacles had better turn his back upon India altogether. They are assuredly the chief subject requiring forethought and caution in the execution of public works in this country, and upon the mode in which we deal with them will depend the broad question of whether our railway operations shall succeed or fail; whether the result from them shall be profit or a loss; whether their execution shall be rapid or slow.

9. So strongly did I feel the importance of this subject, and the danger of adopting in India any of the costly and dilatory principles which have caused so much ruin and delay elsewhere, that I ventured to recommend, formerly, in my official reports to Government, the temporary omission of bridges altogether on the larger class of Indian rivers, rather than damage the character of Indian railway investments.

by risking the interests of the shareholders for the construction of those great masonry viaducts of former days. Our more recent practice, however, and the improvements and experience of the last few years, in our iron structures of this class, fully justify me in saying that no such inconvenience to our traffic, as a temporary omission of the larger bridges, will be now required, if we can obtain iron at a reasonable rate—and that point the investigations made by this Company have placed beyond the shadow of a doubt; still, however, the bridging of rivers will be the vital point in Indian railway construction.

10. The first question, then, to be answered by a railway company in India is, how they are to bridge their rivers and nullas. This, accordingly, has been our chief subject of consideration. In reference to it, I have framed a comparative estimate (Appendix No. II.) of the ordinary modes of executing a viaduct by the use of masonry or of iron; considering, likewise, whether the iron to be employed shall be of English or of native Indian manufacture, provided the latter can be obtained. The present competition price of English iron having reached about double the first-cost remunerative price under the former steady rates of wages, and the probable future demand upon the English market from foreign, colonial, and Indian railways, in particular, make it probable that even the present high competition prices may still be largely increased, unless additional supplies can be produced elsewhere; nor would a moderate increase of produce go far in keeping down the competition price contemporaneously with a very large increasing demand for that produce. No railway company, under such circumstances, could expect to obtain their iron at anything near to a fair remunerative price, unless by manufacturing it on their own account. A foundry opened in India by an ordinary speculator would have little effect, except as regards the question of freights, in reducing the price of iron to any particular railway company, beyond what an additional foundry of the same manufacturing power established in England would have; the price of its produce being regulated, as a matter of course, by the general rate of the market.

It was in this view of our case that I selected a geologist to accompany our first surveyors, and his attention has been devoted exclusively to the mineral districts of the Nerbudda in the vicinity of our line.

His efforts have been most successful, and his reports (Appendix No. III.) will be read with much interest. Mr. Jacob states the existence of a rich and inexhaustible supply of iron ore at Chandghur, with an ample quantity of lime and timber for charcoal in the immediate vicinity, as well as a first-rate quality of coking coal in large quantities, and easily obtained, at Benar, higher up the river. The ground between the coal and iron, and that between the proposed foundry and

our general line, he states to be most favourable for railway construction, and situated in a rich traffic district.

12. By referring to Appendix No. II., we find, from the comparative estimate, that if we construct our viaducts, rails, &c. of native iron of our own manufacture, we may calculate on executing our railroad at an average rate of £3,999 per mile. That if we adopt the same principle of construction, but purchase our iron in the English or other market, we may calculate on expending £7,041 per mile; and if we use brick-work or masonry viaducts, with English iron rails, our outlay would be £8,717 per mile.

Hence, then, the very first preparation that I should earnestly recommend, to enable us to secure the most successful result in our future railway operations, would be the immediate establishment by our company of a native iron foundry.

I can have no hesitation in recommending that the site of such foundry shall be at or near Poonassa, in the neighbourhood of what I believe to be the best iron district in India. The ore being as inexhaustible in its quantity as it is superior in quality, I am justified in recommending the adoption of this locality, not only upon the authority of our geologist, who has devoted much time to its examination and comparison with other mineral districts, and who has tested its ores by repeated and careful analysis—I base my recommendation on the still more convincing fact that its ores have been manufactured from time immemorial, and continue to be manufactured extensively to the present day by the Natives, in their own rude costly method, and that the metal they produce, the Chandghur iron, has always been considered of the very highest quality; that the situation of Poonassa is considered healthful; that there is the best quality of lime for our purpose in close proximity; that there is a very large supply of charcoal jungle in the neighbourhood, and that when that may fail, we have a first-rate quality of inexhaustible and easily-worked coking coal higher up the river to depend upon for our fuel, the road to which would pass through a country favourable for railway construction, and a good traffic district.

Under these circumstances, I cannot hesitate to recommend the immediate establishment of an iron foundry at or near Poonassa, as an indispensable essential to the fullest success of our railway operations.

13. The attention of one of our engineers, Mr. Green, has been especially given to test the beds of the principal rivers. He was furnished with the requisite boring tools for this purpose, having had considerable experience in the construction of viaducts such as we require. His examination of the Taptee and Nerbudda (Appendix No. IV.) justifies me in recommending that these rivers should be bridged by an iron superstructure, supported on iron pile piers. The bridging

of these two rivers will be the most serious operations we shall have to encounter in executing our works. We have had some screw-piles made by the ordinary smiths in Surat, to try their capacity; and the result of this, and other operations of a like tendency, has been very satisfactory, showing that, by patience and perseverance on the part of our officers, we may calculate upon good service from the Native mechanics of India.

14. The whole of the main line was divided into five districts, for surveying purposes, over which the officers were spread in the first instance, in the expectation that, at a sufficiently early period to admit of the Taptee branch being completed before April, portions of the main line would furnish the officers required for this duty.

15. I found myself, however, at the beginning of February, with only one officer, Mr. McMahon, available for the Taptee. Fortunately, the kind support of the military has enabled me to meet this difficulty. Three high-spirited, able, and enterprising young officers, Lieutenant Barton, Ensign Jervis, and Ensign Lamb, obtained leave to assist me in this operation, and these three gentlemen, with Mr. McMahon, were able to make a most successful sectional *reconnaissance* of the Taptee line during the month of February.

16. Sir Robert Hamilton's effectual aid, his extensive views, and his minute and general information on every subject connected with Central India, have been invaluable to me, and I consider it most fortunate that I should have met him at Broach, and had the benefit of a fortnight's occasional intercourse with him, until he left my route at Songheir.

17. Major Swanson's continued assistance to our officers, also, and the great trouble he has given himself to promote every useful arrangement at Bombay, have been as disinterested as they were effectual. In fact, every officer, civil and military, who could aid us, has done so to the utmost of his power. Nor have the Native princes appeared less anxious than our own countrymen to promote the great object in which we are the humble instruments. Amongst those, His Highness the Guicowar has proved his appreciation of our work by every mode in which he could assist our officers employed in his territories.

18. The sections* herewith will show, that throughout the whole of the country we have proposed to open by railway, the great obligatory points have been mathematically selected with reference to the three first essentials of all railway lines, viz. commercial fitness, distance, and economy of engine power as regards gradients. In the securing of these three essentials, Baroda appears to be the most influential point

* The sections are of too voluminous a nature to be conveniently published with this compilation.

of India, whether considered in reference to its existing state, or contemplating the highest degree of intercommunication that can be hoped for hereafter. It is a point through which the shortest and levellest road, leaving Bombay in a northerly direction, must pass. It is a point that must be passed by the shortest and levellest road, leading out of Bombay towards the west, in which direction a large and rich proportion of the territory of that Presidency is situated.

19. Either Baroda, Broach, or Surat must be passed going from Bombay, by the shortest and levellest line to every point in India, north of the Taptee Valley inclusive, situated in a north-easterly or easterly direction, for either of those places. Baroda is a point that must be passed by the shortest and levellest route that can ever be selected between the seat of the general Government of India at Calcutta, and England *viâ* the Persian Gulf, giving a line from its junction with the Calcutta railway near Allahabad, of the highest mercantile advantage, in its whole course, through Central India, combining, as it would, the interests of the Saugor and Nerbudda, the Malwa, Guzerat, Rajpootana, and Scinde territories; and this important line, passing as it must near to the rich mineral district of the Nerbudda, will spread its *indispensable* products for the general development of our resources throughout every district of India.

20. The interests of the admirable harbour of Bombay are not really at variance with the general interests of India, although the Deccan, probably from that fostering affection which grows out of early association, close proximity, and certain enjoyable qualities which its climate can offer, may now produce that result. Partiality to one's own small locality frequently obscures the mental vision, and stands in the way of the broadest and most important general interests. In the present case, however, there is the most ample protection against any danger of the kind—*1st*, in the local Government of the Presidency itself; *2nd*, in the general Government of India, presided over by a nobleman who, from long experience, understands thoroughly every principle that should regulate the railway system; *3rd*, in the Honorable the Court of Directors, who will consider the subject in its most general bearing, and far removed from all local influences; and *4th*, in the Board of Control. These various authorities cannot fail to reach a final correct conclusion, if the subject be brought fully before them in all its bearings.

21. The advocacy of interested parties must necessarily be received with much caution; and as my present position places me in this class, it is right that I should refer to the expression of my opinions upon this subject prior to my connection with any individual company, and when the broadest public grounds alone could have influenced me. The arguments which I then offered are those which I now repeat. The lines

of intercourse which I now sustain are those which I then projected. The errors which I now oppose are those which I then detected, and officially resisted.

22. But why should the commercial interests of all India be overlooked, and its great lines of intercourse be deranged, in order, that the trunk line of railway from Bombay should run through the Deccan, in the face of all the obstacles which nature has opposed, and outraging every principle of science and sound policy? Is it the natural or artificial productions of that locality that entitle it to such a preponderance?

If so, they are not known to that very able and well-informed officer, Captain Wingate, of the Revenue Survey Department, whose special duty it was to have known them. In speaking of the assessment in Khandeish, at paragraph 4, he says:—"The soil of Khandeish is more fertile, and yields heavier crops, than that of either the Deccan or Southern Mahratta Country." At paragraph 6: "Irrigation is more extensively practised in Khandeish than in the Deccan or Southern Mahratta Country." Paragraph 54: "These rates could not be paid at all in the Deccan, *but the superior fertility of the soil in Khandeish*, and the ease with which its products can be converted into money, from nearly all being grown for export, as well as the advantages enjoyed by the cultivator, in being allowed the privilege of free grazing over the wastes of Khandeish, make them in reality far less onerous than would be supposed from simply comparing them with the rates on dry crop land elsewhere."

Again, at paragraph 55:—"In proof of the comparative abundance of money in Khandeish, I may also instance the fact that all labour there—agricultural as well as other—is paid for in cash; whereas in the Deccan and Southern Mahratta Country, agricultural labour is almost universally paid for in grain."

23. By the foregoing extracts, we find that Khandeish, about which so little was *generally* known, that on my proposing to open it by railway, my proposition was objected to as impracticable; yet it appears that Captain Wingate had previously ascertained its vast capabilities for relieving the Deccan population, as well as its agricultural superiority over that district. Can any one explain, then, on any moral, political, or commercial grounds, why the rich produce of Khandeish and Berar is to be shut out from the power of reaching their natural port of Surat, that it may be carried a much longer distance, over a very inferior line of road?

24. Can any one say what is to remunerate the Northern Konkun; the Broach and Surat Collectorates; the Guzerat, Malwa, and Rajpootana districts; Scinde, the Punjaub, and the North-west Provinces generally, for the round-about, up-hill journey that their goods and travellers must

make, to have the honour of approaching and leaving Bombay by a Deccan grand trunk road over the Sahyadree Ghauts, the Chandore Ghauts, the Satpoora range, and the Vindhiah range?

25. I feel confident that no such injury will ever be forced upon the traffic of India, but that the substantial interests of the Deccan territory will be fully and fairly protected by opening up that intercourse which its local necessities require, *without prejudice, however, to the general progress of India.*

26. Having adopted, on the grounds above shown, Surat, Broach, and Baroda, as three inevitable points in any main trunk line of railway going from Bombay, in reference to the northern, north-western, and north-eastern traffic of India, each of these respectively becomes the key or turning-point for the various districts that bear upon it, viz. Surat, for its own extensive Collectorate, the eastern portion of Guzerat, Khandeish, Berar, Nemar, and all the territory bearing to the north-eastward, till we form a junction with the East India Railway, at or near Allahabad.

27. Broach, for its own Collectorate, the Nerbudda territory, Nemar, Malwa, and the territory north-eastward, likewise to the junction with the East India Railway, at or near Allahabad.

28. Baroda is the key, or traffic pivot for all districts to the west, north-west, north, north-east, and east. The sea, the great rivers, and the several high mountain ranges, in the positions that they respectively occupy, have given to these points an importance of which they cannot be deprived, unless at the cost of outraging every principle of sound policy and scientific fitness.

29. With respect, then, to the main trunk line from Bombay as far as Baroda, the broad direction for it by the coast is fixed and inevitable.

30. As to the continuance of the main line from Baroda to the north-west, we have taken a trial section between Baroda and Agra, *via* Godra, Dohud, Neemuch, Chittore, Tonk, and Hindoun, and have found there a practicable line, giving maximum gradients not exceeding 1 in 330, with the exception of the portion between Godra and Rutlam, where we have instances of gradients up to 1 in 120.

31. The country in this particular locality is somewhat difficult; and I was induced to take my first trial section through it, to combine, if possible, two objects, by making our general trunk line top the Malwa traffic at Rutlam, whence a branch could subsequently be driven eastward.

32. Desirous, however, to obtain a still better maximum incline than 1 in 120, I ordered the examination of the more direct route from Godra towards Neemuch, following the line of the Mahee river in a north-easterly direction. It is clear, as well from the course of the valley as

from every report I have had concerning it, that the inclines on that route must be much superior to those between Godra and Rutlam. The sections of this alternative are in progress.

33. I have had perambulatory reports upon a third line from Neemuch to Baroda *viâ* Oodeypoor: these reports, however, have not been favourable.

34. A fourth alternative, which must prove perfectly satisfactory in every respect, is the line from Baroda to Delhi, *viâ* Ahmedabad, Puttun, Deesa, base of Mount Aboo, Sirohee, Palee, plain skirting Aravalli Mountain on the west, close to Ajmere, and on to Delhi. This line would avoid the great central range of hills entirely, turning it by the west. It would not be longer than the line from Baroda to Agra by Neemuch. It follows the direction of an intended branch line, and would therefore save the construction of that amount of road. It would be in the proper line of approach to the extreme west of our empire at Kurrachee, for a distance of 120 miles. It would pass through the fertile and rich traffic district of Guzerat. It would also pass by the great market of Palee. The section of this line has been made from Baroda to Ahmedabad, the levels of which are excellent; and all my informants are unanimous in describing the country from that on to Delhi to be peculiarly level, and free from every impediment to the construction of a railroad, as it evidently must be. In short, it appears very questionable, however good the gradients on the line by Neemuch may ultimately prove, whether the Baroda and Delhi line by Deesa would not be preferable on general grounds.

35. If it should be adopted, however, in preference to the Neemuch line, an especial branch from Baroda into Malwa would be required. With this view, I examined the Tyrella pass in the Vindiah range, and found it to possess every facility to insure the power of constructing a road with good gradients. The country rises very gradually the whole way from Baroda to the pass, and thence there is no difficulty to Indore, a point to which a great portion of the Malwa traffic at present converges.

36. A line from Baroda to Indore would admit of extension eastward, to connect with the Calcutta line, at or near Allahabad, and it could throw off branches to the northward, to any extent that the traffic of the district might require.

This line commands, likewise, the power of giving an approach from the northward to the Nerbudda mineral district, by an extension branch along the Nerbudda north bank, from the point it reaches before entering the Vindiah pass; and I believe it is impossible to overrate the beneficial consequences that the Nerbudda mineral district is calculated to produce in the industrial development of India, if properly dealt with.

BASSEIN ALTERNATIVE.

37. I was not satisfied with the line first selected in No. 1 division, by which a circuit of 16 miles would be forced upon our goods and passengers in reaching Bombay, as compared with the more direct route through Salsette; and I ordered a trial section of the alternative line, from a point near the meeting of the Veeturnee and Taunsa rivers to Bombay, passing near Bassein and Mahim.

The Bassein alternative proves to be infinitely preferable to the route originally selected.

The levels are much better, the line generally much easier of construction, although it gives a somewhat increased quantity of viaduct, and the length saved on the journey for goods and passengers is 16 miles, whilst it enables us to have our terminus at Bombay instead of Callian. The bed of the river at Nowghur has been tested by boring, and it offers excellent strata through which to sink our pile piers for supporting a viaduct. There can be no question as to the propriety of adopting the direct Bassein alternative in preference to the very circuitous route by Callian.

FOUNDRY BRANCH.

38. My reason for not having executed a section of the line from Julgaum to the proposed Poonassa foundry, and thence to the Benar coal-field, is, that being quite satisfied with the report of Mr. Jacob, together with my own observations as to the facility of constructing a good line through that district, when I went to put a party to take the section I found the engineers of another company already occupied in the same work, and it appeared quite superfluous that a duplicate section should be taken by me, when so much important information was wanting on other districts. I therefore placed my party elsewhere. The information furnished by the other company will be no doubt ample to enable the Government to come to a decision on all matters relating to the district in this respect.

TANKARIA BUNDER BRANCH.

39. The sections of the Tankaria Bunder branch, which were executed four years ago at the cost of his Highness the Guicowar, have been already brought under the consideration of the Government; and therefore, although that branch forms a portion of the present project, it does not appear necessary to furnish the sections again. The line passes through a rich and level district, where the works would be easily constructed.

AHMEDABAD BRANCH.

40. If it should not ultimately be decided to continue the main line from Baroda to the north-west, by the way of Ahmedabad, Deesa, Palce, &c. to Delhi, still the branch from Baroda to Ahmedabad will remain a very important part of our project. It will pass through one of the richest districts of India, and will be open to an extension hereafter in the direction of Kurrachee, giving the power of throwing off branches both to the southward and northward to meet the requirements of the Southern Guzerat, as well as the Rajpootana and Scinde territories. The Ahmedabad branch offers the best possible levels, and will be of easy construction, the only work of any importance upon it being the viaduct over the Mahee river.

BOMBAY TERMINUS.

41. Considering the heavy expenditure that the Government have already incurred to provide an entrance through the town and suburbs of Bombay to the terminus of the existing railway, it is extremely desirable that the public finances should not be again taxed for a similar object in the same locality; and that the proprietors of houses and lands in Bombay should not be put to the inconvenience of having a second line of railway opened through their city. It might therefore be desirable to suggest to the Government the possibility of making such arrangements as would enable both companies to have their termini at the same locality; additional lines of rail, &c. might be put down by us adjacent and parallel to the existing line from the Byculla bridge to the termini, and our workshops and other station-buildings might be established on the Flats or vacant ground to the northward or eastward of the race-course. Such an arrangement would probably be attended with the smallest possible amount of inconvenience and cost to the numerous interests concerned.

42. It is hoped that our exploration has now been carried sufficiently far to justify the Government in arriving at a decision as to the general eligibility of our project, keeping in mind that no alternative route can be proposed for the continuation of our line to the north, north-east, or north-west of the Nerbudda river from Bombay, which must not diverge from the obligatory point of Baroda; and that therefore the operations to the southward of Baroda may be at once executed, in the full confidence that whatever line or lines may be finally decided upon in reference to the northern territories referred to, must converge to Baroda, and that therefore no discrepancy on this ground can hereafter occur.

43. In reasoning upon lines that are to affect the northern, central, north-western or north-eastern districts of India, we must not forget

the general features of the country through which we have to pass. In this view, the Sahyadree range having decided our course for the first portion of our trunk line from Bombay northward till we reach the important points of Surat, Broach, and Baroda, and the opening of the Taptee Valley, to a junction with our trunk at the port of Surat, being equally inevitable, our lines from the fixed point of Baroda must be regulated in reference to the great central range, which commences to the westward with the Aravalli mountains, running in the direction of Ajmere and Mount Aboo. These are connected by hills going south-eastward to the Vindiah range, which continue the chain to Oomerkuntuk table-land. These heights are followed by others that end close to the Ganges, near Rajmahal.

44. Our objects are two-fold—*1st*, that of opening a general line of intercourse from Bombay, to the north-west of India, to meet at some convenient point the Calcutta line of railway; *2nd*, in connection with this, to secure the future attainment of railway intercourse to the districts of Central India, which are situated for the most part to the northward of the great range above described. This latter object cannot be effected without going over some part of the range. The former may be effected either by going over some part of the range, or by turning it altogether by the westward.

45. The true nature of what is now required of us calls for some explanation, that it may not be confounded with the class of railway projects usually brought forward in England, and limited to some 50, 100, or possibly 200 miles, running through a well-known accessible country, which has been all accurately surveyed and recorded on correct maps, where the whole object is simple and well defined; to carry a short line between two specified termini, where the most rapid means of conveyance are everywhere at hand to carry all concerned the short distance required to reach their respective points of the work; where the working year is twelve instead of six months, and where communication by letter is certain and immediate.

46. Our task is of a totally different character. The length and breadth of our project extends over a territory about double the size of Great Britain; a territory of which little is known, as relating to our object, of which accurate maps do not exist; a territory through which the vast journeys required for exploration must be made under a hot sun at the slowest pace, on our own exhausted and way-worn horses; and where, in many instances, it requires three weeks to obtain an answer from an officer at an out-station. It is not a mere line between two given termini, but a vast system of railways, which must be so cautiously planned, that however gradually executed, it shall be certain to secure, by future extension, the interests of every minute district.

If we take a more limited view than this of our important task, we must commit grievous error, and entail irremediable injury on large masses of people, whose interests are placed in our hands.

47. The preliminary operations which may be most fitting to bring forward an English project would be palpably inapplicable to ours.

48. Our first process must be a mere exploration of what may be considered the regulating approaches or main-traffic arteries for the different districts, on a combined principle, and where two or more lines appear to offer equal advantages they should each be explored. This exploration is not intended to offer precise data for the construction of works, but a mere general view, that shall establish the fact of how far the country so examined is fitted to receive such works at all, and to afford a means of comparison as to which of several lines may be the one that should be selected for a common object; the selection having been made by Government from such data. The second operation would be that of preparing minute working sections of the portions so selected, with a view to construction.

49. We have already sectioned about 1,200 miles, and examined without section about as much more. The cost of these sections, and the time that the different classes of section respectively occupy are most variable, chiefly depending on the judgment and energy of the officers conducting the work of the several divisions.

We have had one short sample, which crept on at the slow rate of about one-third of a mile per day, until it was suspended, the field-work costing £13 per mile. Our preliminary exploration, if that had been the general principle adopted, would probably cost, with our force, twelve years in time, and £200,000 in money, including the various collateral expenses.

The cost of field-work, however, of good trial section, has varied from £2 to £6 per mile, the rapidity of progress being in the inverse proportion to the cost. We have had another description of examination or sectional *reconnaissance*, which costs about 4s. per mile, and is executed much more rapidly than the trial section. The sectional *reconnaissance* is quite sufficient for the first examination, which is only intended to offer a comparative general view of all competing lines, and to be preliminary to a minute working section of the portions selected for construction.

It is hoped that enough has now been examined and brought forward to justify the Government in giving a favourable decision on our project generally; and if the principles put forth be approved, to justify likewise a sanction for the commencement of our works in the next cold season.

50. Our first year will necessarily be one of organisation.

If we can in that period establish our iron foundry, and construct forty or fifty miles of road, to organise our department, we shall have our work thoroughly started; we may afterwards calculate on constructing 100 miles the second year, 150 the third year, and 200, if required, each subsequent year, till completion. But, to act wisely, we must organise well. The more cautiously we start, provided there be no unnecessary delay or inertness, the more certainly and rapidly we shall arrive at our goal, and emancipate the labour, the capital, the produce, and the traffic of Central India.

51. There is a very large margin in the present cost of transport of almost every commodity that is moved from place to place in this part of India, quite sufficient to afford a large profit to any well-conducted railway company, leaving still a very large reduction in favour of the public.

52. In passenger traffic, the first class by railway will pay about one-fifth of what is now paid for palanquin travelling, and one half of what is paid by first-class steam-boat travellers, whilst the lowest class of railway travellers will pay but one-third of what a bullock cart would cost, and less than the lowest class of steam-boat travellers would pay, but more than would be paid in a country boat. It is to be observed, however, that notwithstanding the great difference between the present third-class fare in steam-boats and the low rate charged in country boats, still the former are much crowded by passengers of the poorer classes.

53. With respect to goods, it appears that all land-borne goods would be carried by railway at a considerable saving as compared with the present cost of transport; that there would be a saving, too, as compared with steam-boat prices; and that the cost of goods by country boats would, in very rare instances, and to a very trifling extent, even in their nominal rates, be below the railway rates; whilst the universally admitted losses, delays, and frauds attending that class of transport would, in reality, bring the cost considerably above the railway rates.

54. Considering the importance that an easy approach to a railway by the ordinary carriage roads must have upon the interests of all concerned in its success, a few words may not be out of place here, in reference to the roads of the districts to which our project refers. They are now in a very bad state indeed, chiefly owing to the fact of their not being metalled, and the annual injury done to them immediately after the monsoon rains. During the actual continuance of the monsoon, all travelling of wheel carriages is suspended; but the moment the rain ceases, and before the surface has had time to become dry and hard, the carts appear upon them, and in a few days of this premature work deep ruts are indented by the wheels, which last throughout the year, as the surface soil with the new ruts rapidly indurates from the effects of sun and wind.

The vast extent of roads of this class which the intercommunication of the country requires, and the very costly process of metalling, from the absence of the required materials in that class of soil where the roads are most susceptible of injury, put it out of the question to hope that any reasonable investment of money could furnish the required remedy by metalling the surface on so extensive a scale, and within any moderate limitation as to time; much, however, might be done by mere arrangement, with a very small outlay.

The surface dries and hardens very rapidly after the rains cease; and if the old ruts were filled in, and the road made smooth whilst it is in its humid state, and that then all wheeled carriages were kept off it for a very few days, until it has had time to dry and harden, there would be a comparatively good road for the whole of the ensuing year.

The mere prohibition of carts using the roads for a few days after the cessation of the rains would not suffice, without a regular road police being established to insure it.

If two or three men per mile of road were employed towards the end of the rainy season, in the first place, to smooth in the ruts, and afterwards to keep it clear of carts until a regular notification had been made public in the district opening the roads for traffic, the serious injury to commerce now complained of would probably be remedied; and if an effort were made to enclose and drain the roads, by making a ditch and bank on each side, raising somewhat the centre of the road, which would not be an expensive operation, it would be a great improvement, and an assistance to the enforcement of the regulation above recommended.

55. It would be most unjustifiable in our company, whilst offering a project which is to affect the general traffic of Central and Northern India, to overlook the very important subject of the nearest harbours by which the importation and exportation of produce can be affected. Were we to do so, we should expose ourselves to the discreditable imputation of seeking to force, for our own interests, unnecessary mileage by our railway on the transport of goods—a course which would be as impolitic on our part as it would be discreditable, because the natural effect of thus adding unnecessarily to the productive cost of articles is to diminish their consumption, which would react injuriously upon ourselves. If we seek to discountenance the ports of Surat, Broach, &c., in order that we may carry certain articles 200 miles past those natural termini, we shall force upon them an additional cost of, say from 8s. to 16s. a ton, which would be detrimental to all classes of goods, and might be absolutely prohibitory to many of the lower kinds.

We find from the custom house returns, that the imports and exports from the ports of Guzerat, during the year 1852-53, amounted to the

value of £3,513,148, and that this large trade has existed, notwithstanding the omission of all available measures which might be adopted to improve the navigation and the trading conveniences of those ports. Their trade would, no doubt, be much increased by any effectual measure that would facilitate the reception of a larger class of shipping than that now employed. The most effectual improvement would be to construct an artificial harbour on the most convenient part of the coast, which would, probably, be outside, and southward of the bar, in the vicinity of Surat. But as any measure of this kind would require a large investment of money, it would be desirable, before adopting it, to try the effect of the very simple and inexpensive process of dredging, with a view to facilitate the entrance, the exit, and the anchorage for larger classes of vessels than are now used in the rivers at Surat, Broach, and Tankaria. If the dredging process were found effectual, which I have little doubt it would be, the costly construction of a harbour outside would not be required; and in recommending the principle of dredging, it is satisfactory to find that I am sustained by the high authority of Admiral Maitland on this subject. One or two dredging boats with proper apparatus would, at a very trifling cost, soon prove how far that principle would be found efficacious.

There can be no apprehension of opposition from the enlightened mercantile classes of other localities, as regards any improvement of the ports referred to. The world is beginning to understand that the most liberal policy on such subjects is that which best secures every individual interest.

56. The extensive inundation to which the town of Surat and its neighbourhood periodically are subject during the monsoons induced us to take the section on two alternative lines, in approaching the Taptee river from the southward. That to the eastward is the most direct general line, and is clear of the inundated land, but it passes the large and trading city of Surat at the inconvenient distance of seven miles, and would involve the necessity of continuing the Taptee line to the westward of the general line, until it reaches the eastern suburb of Surat. This latter branch would necessarily traverse a portion of the inundated land.

57. Upon a full consideration of the details, I feel disposed to recommend that the main line should come close to the city, as shown by the western alternative line: it avoids the confusion of having a short branch line, which is always inconvenient and costly. Besides, I look upon the removal of the dreadful scourge, to which the population of 80,000 inhabitants are now periodically subject in Surat by the inundation of their city, as certain, so soon as the subject shall be earnestly taken up by the Government. I do not believe that the remedy

would be either difficult or costly, and of its successful application there cannot be a question, if it be committed to the intelligence and skill of the Bombay Engineer Corps. It is assuredly a subject well worthy of their best efforts, firmly sustained by the Government, to relieve so large a population from such a frequently recurring calamity. The houses in the lower portions of the town are credibly stated to be occasionally flooded to a height of 10 feet and upwards, and some of the measures heretofore applied, with the object of mitigating the evil, must on the contrary have increased it. Amongst these may be stated the opening of communication by cuts, or nullas, between the Taptee river and the Surat basin. As long as such communications exist, the floods of the river will have an easy access to the Surat basin, and the city must through them be inundated. Not only should all such cuts and nullas be closed against the passage of the river waters, but a bank should be raised, of an ample section, on the Surat side of the river, to prevent the possibility of the water escaping on this side from the river. If such an embankment were raised, and the nullas cut off from the river, and if the surface-drainage of all water falling upon the basin itself were contemporaneously provided for by cuts, not into the Taptee, but running towards the southward and westward to the sea, there would then be no more inundations in Surat or its immediate neighbourhood.

58. I shall now conclude by stating the progressive order in which it may be desirable to proceed with our operations. Keeping in view the suggestion of the Most Noble the Governor General as to the propriety of commencing from Bombay, and uniting with that principle a vigorous effort to avail ourselves as far as possible of native iron of our own manufacture in our works, both as regards the permanent way and viaducts; our course then would be—

1st.—To make a strict working section of our line from Bombay to Surat, and thence by the Taptee Valley to the site of our foundry and the coal-field, establishing the works of our foundry at the same time.

2nd.—Having accurately staked out our line, select the sites for the permanent road-side stations at convenient points suited to the expected traffic, averaging say about five miles apart, and build an economical description of station-house on a given plan at each of those points, which would afford immediate accommodation along the line to our officers employed in the execution of our works.

3rd.—Select all those points where masonry or brickwork would be inevitable, and make immediate arrangements for all the materials being prepared and brought to the respective places where they are to be employed, and proceed with the execution simultaneously, as such structures are the chief cause of delay in the completion of railways;

at the same time commence the construction of earthworks, both at the Bombay end and at the foundry, and work both ways till completed.

4th.—As soon as our officers have completed the staking out of the line, and the strict working section between Bombay and the iron foundry, a portion of them should be moved up to execute the like operations on the remainder of the main line, that is from Surat to the junction with the Calcutta line at Agra.

5th.—The permanent way iron viaduct, and every description of iron required for the first 100 miles out of Bombay, to be contracted for in England, and ordered out, so that no delay may occur in laying the road after the earth-works have been sufficiently seasoned and tested by the monsoon rains. This, without delaying the progress of the work, will admit of the requisite time to ascertain the success of our exertions in seeking to supply ourselves with native iron for the future.

6th.—Proceed with working section and construction of the branches from Baroda to Ahmedabad, and from Baroda to Tankaria Bunder, on precisely the same principle as that already recommended for the main line.

7th.—As soon as the produce of our iron foundry becomes available, we should commence laying our permanent way and viaducts from the foundry, and work to meet the finished road coming up from Bombay; this will open the communication for furnishing our own iron along our line.

59. The principle of the system of construction above sketched seeks to obtain the utmost advantage that can accrue from the successful establishment of a native iron foundry, without, however, delaying the general progress of our railway construction in the slightest degree on that ground.

60. It now only remains for me to bring under the notice of my colleagues the untiring zeal that our officers have exhibited in the execution of their arduous duties, and their conciliatory bearing towards the Natives of this country. Assuredly, the liberality with which they have hazarded their lives will be responded to by an earnest consideration of their interests. They were not niggardly in their exertions; unflinchingly have they toiled through those very jungles where death was loudly predicted as their doom. Happily, the protection of Him who is mighty to save has enabled them to come forth unscathed.

J. P. KENNEDY, Lieutenant Colonel,

Managing Director and Engineer in Chief.

Bombay, 28th April 1854.

APPENDIX No. I.

INSTRUCTIONS LAID DOWN FOR THE EXECUTION
OF THE SURVEY.10, *Liverpool Street*, 20th September 1853.

The officers selected for executing the survey of the line in India shall take precedence in the order in which they stand in the following list, until further orders:—

Managing Agent and Engineer in charge	No. 1. Mr. J. P. Kennedy.
Resident Engineers.....	2. „ Geo. Taylor.
	3. „ Bland Hood Galland.
	4. „ George Simmons.
	5. „ A. Matthews.
<hr/>	
1st Class Assistant Engineers	No. 6. Mr. Thos. Wm. Rumble.
	7. „ J. T. Green.
	8. „ R. T. Plant.
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2nd Class Assistant Engineers ...	No. 9. Mr. John Jas. Carey.
	10. „ Robt. Handcock.
	11. „ Wm. Galway.
	12. „ A. Jacob.
	13. „ H. Aher.
	14. „ R. McMahon.

Accountant, and Chief Clerk to Engineer in charge..... No. 15. Mr. J. E. Shepherd.

2. Every order issued by Mr. Kennedy, the engineer in charge of the survey and works, is to be strictly obeyed; and he will locate the officers, and make such changes in their location and duties as from time to time he shall think fit.

3. The officer going out in charge of the party will ascertain and report, before embarkation, whether every engineer is furnished with the proper instruments, both for field and office work.

4. On the passage out, the officer in charge will take care that a sufficient number of copies of the maps furnished to him are made by the engineers, so that every person may be provided with all that refers to any portion of the line on which he may be subsequently employed. These copies may be made in lengths of the line corresponding to districts and sub-districts, embracing a width that shall exhibit the basins from which the waters affecting the line on those portions proceed.

5. As soon as the packet arrives at Bombay, the officer in charge will report the arrival of his party to the Secretary of the Government, and request that a document may be given to him, addressed to the various authorities in the districts through which the survey will extend, directing that such support and assistance as our operations require may be afforded.

6. Every effort should be made to obtain local information ; and the officer in charge, with this view, will forthwith put himself in communication with Major Swanson, who has already been requested to obtain lists of surveyors, draftsmen, interpreters, chainmen, tent-makers, &c. &c. ; and it is hoped that he will feel disposed to assist, with his valuable advice, in everything requiring local experience.

7. The accountant will be the fitting person to look to the immediate supply of the hill tents and rowties, and the employment of the means of transport for tents and baggage, in order that the engineers may be left free to look to those subjects that require their observation at Bombay, prior to commencing work—amongst which will be an inspection of the works done by the Indian Peninsula Railway Company, ascertaining the elevation of the roadway at the terminus above high and low water ; the degrees of slope given to different cuttings and embankments, and how those slopes have respectively resisted the effects of the violent season rains peculiar to that country ; the head-way given to viaducts above the highest water-level in passing creeks, rivers, and inundated lands, and how that head-way has been found to answer in practice : in short, every observation must be made as to all those points interesting to our future operations that can be obtained from the executed works of the Great Indian Peninsula Railway Company.

8. It is important that the least possible delay should occur at Bombay in preparations ; and it is hoped that, upon the third day after reaching Bombay, the officer in charge may be in readiness to direct his attention, with that of the other engineers accompanying him, to the most essential preliminary of our work, viz. the junction point of our line with that of the Indian Peninsula Railway, which would, probably, be the point where that line reaches the main land after passing the Tanna creek, or immediately before passing that creek. Too much consideration cannot be given to this question, or to the probable fitness

of the level at the point of junction as the general level which is afterwards to be adhered to on the whole extent of the coast portion of our line.

9. Mr. Taylor will here at once set his party to work, as his district extends from Bombay to Boree, being one-half of the coast line to Surat. He is to examine the alternative mode of leaving Bombay by Mahim, and the western coast of the island of Salsette, and will take a trial section of this, as well as the creek separating it from the main land, so as to be able to show, distinctly, the reasons for and against making this route our approach to the terminus at Bombay; but by whichever of the alternative routes it may ultimately be decided to reach Bombay, both must be given to the point on the main land where they would unite; and it is to be clearly understood, that from that point to Boree a contract section and survey of the line must be made, as rapidly as possible, by Mr. Taylor and his party, giving him such local assistance of Native surveyors, draftsmen, &c. as may appear desirable, to insure completion within the months of November and December. Mr. Taylor's party is the only one that will require to be provided with tents, and means of transport, at Bombay, as all the other officers, with the exception of Mr. Jacob, are to proceed without delay by sea-passage to Surat, where they can provide themselves with the requisites for their future operations.

10. Mr. Jacob will immediately proceed from Bombay by the most rapid means of travelling, *viâ* Tauna, Thull Ghaut, Nassick, Chandore, Malligaum, Dhoolia, and the Sindwa Pass, to Mundlaisir, where he will find Lieutenant Keatinge, the Political Agent of Nemar, who will be able to furnish him with all local information as to the coal, limestone, and iron districts in the vicinity of Charwah—to which Mr. Jacob will forthwith direct his investigations, examining the openings that have been made by previous investigators, and carrying on such further experiments as his judgment may point out to be necessary for a comprehensive report on the quantities and qualities of those and other resources of this district, and the probable cost at which they may be produced; informing himself, also, as to the best routes which it may be desirable to examine, and to open, with a view to the most economical transport of the produce to our main line in the neighbourhood of Surat, &c.

Mr. Jacob will be authorised to employ labourers and other assistance within reasonable limits,—say £50 per month, if necessary,—to follow up the investigations with which he is charged on this subject.

He will use every exertion to find out whether the mineral district above referred to is the nearest one to the site of our proposed line of railway; also, whether there may not be a cross line of intercourse

opened, with a falling incline, from the coal and iron districts in question to the Taptee river, by Asseerghur, or any other route ; and whether the valleys of the Taptee and Nerbudda, or either of them, are likely to furnish timber of a quality calculated to facilitate the construction of a log tram-road from the mines to the sea." He will transmit, by every mail, direct to the Secretary of our Board in London, a periodical report of his operations and progress, with suggestions as to any steps he may deem it judicious for our company to adopt, with a view to the most rapid and effectual preparation of a supply of iron and coal, and to the opening of a road, whether log tram or iron rail, for the conveyance of the same ; and he will forward a duplicate of all such reports to Mr. Kennedy, the engineer in charge at Surat.

11. Mr. Kennedy will proceed from Bombay by the first vessel for Surat, with all the engineers, except Mr. Taylor's party and Mr. Jacob ; and when he arrives there, he will, with the least possible delay for equipment, send forward the remaining parties to their districts, in conformity with the accompanying distribution, affording the local facilities which their duties respectively require. The best animals for transport of baggage will be camels and tattoos, which should be hired by the month, and the British authorities in Surat will be willing and able to give the best advice as to the means of obtaining them and all other matters, and the fair rates at which they should be procurable.

12. Every engineer must understand that our capacity for the task we have undertaken will be tested by our success in turning the natural capabilities of the coast line to the best account, by obtaining a perfect level as regards the traction of load, in its whole length.

Such a principle does not prevent the level of the line from undergoing certain limited changes, but it does absolutely prevent the adoption of any long incline. It limits, in fact, the length of inclines to a maximum that shall not allow the force of gravity to exhaust the momentum of the heaviest train during the ascent of such incline, supposing it to reach the foot with its ordinary profitable velocity ; and it may be safe, in this view, to limit the greatest length of any incline on the coast portion of the line to 100 yards—the gradient of such short inclines not to exceed 1 in 100. This will admit of occasional rises and falls on the line, of three feet at a time, and it will be well that they should not occur at nearer intervals than half a mile. It will be desirable, as much as possible, so to regulate the position of such alterations of level, that the rise may be to a road-side station, where the train would necessarily have to stop. In that case the short incline becomes beneficial instead of injurious, because it diminishes the necessity of the drag in stopping the train, and aids in getting up the velocity at starting in the contrary direction. The subject is treated under the head of "Impulsive

Incline" in my reports. The class of station, too, should be considered in reference to the application of these short station inclines, where a slight elevation or depression of the line appears requisite for other objects. Certain stations may be considered as main or first class stations, where much business would be done, and where every train, even an express, would necessarily stop; others are second class stations, where some of the trains may run past without stopping. It is clear that the first class station would be the most fitting place to raise or lower the line, if the position could be made to suit the other objects in view. It is essential to consider this important question at the *very outset* of our operations, and to keep it constantly in mind. In India, the first preparation for construction, after laying out the line, should consist in the building of road-side stations, because it is essential to procure convenient lodging-places, which these would supply, at frequent intervals along the line, for the reception of the European superintendents of the works, as the country could not otherwise furnish them; and accordingly the best sites for stations, as regards the interests of traffic, should all be recorded on the survey and sections. These will be permanent indices in dealing with the inclines now referred to. If we adopt an average distance of about five miles from station to station, marking the main spots of traffic, we shall not be far wrong.

LAYING OUT OF RIVER LINES.

13. The principles to be applied to the laying out of the river or valley portions of the line are essentially the same as those above given in reference to the coast portion, with the exception that the latter runs on a level, and the former will be on the most uniform incline that the base will admit of. We should follow, as nearly as we can, the contour line of the hills on our properly continued and uniform gradient. It is natural to expect that the rate of inclination of rivers will vary much at different places—being probably much greater near the source, and gradually diminishing till it reaches the mouth, as marked by the following continued line:—

Our object should be to correct this defect, by keeping the line of road up in the central part, as shown by the dotted line; and we can force the advantage of a level line as regards traction, if the general incline be not great. For example, if the general gradient be six feet in the mile, we could have an incline 300 feet long, and rising three feet at the commencement of each half mile, with intermediate levels of 780 yards in length.

SURAT HARBOUR.

14. It will be essential to obtain a comprehensive report upon the best site for a harbour near Surat, and the best mode by which it can be artificially improved, so as to render it a safe port for all the districts situated to its north, north-east, and north-west, embracing especially Guzerat, Malwa, the North-west Provinces, Khandeish, Berar, the Nerbudda, &c. &c.; as it is clear that if the produce of those districts be embarked at Bombay, they must be conveyed 160 miles beyond their natural point of embarkation. The nearest stone quarries, therefore, and the cost at which stone can be obtained for constructing a pier at Surat, must be ascertained, with soundings of such localities as may appear most eligible for the construction of a pier, and every information that can be collected regarding the prevalent winds and state of the sea at different seasons, the ordinary and maximum difference of level at high and low water, spring tides, &c.; in short, every consideration that can affect a harbour, with distinct suggestions and estimates as to the remedies required to meet all difficulties and appliances necessary to fit it for the reception of the largest ships at the lowest state of tide. This should be accompanied by observations, based on minute inquiry, in reference to any past tidal and river deposits which may have produced changes in the depth of water at or near the points suggested, with a due consideration as to the probable extent to which any proposed pier or work of improvement might be expected to impede or promote changes of a like or of any other nature in future.

TIMBER.—TAPTEE BRANCH, LOG TRAM-ROAD.

15. The attention of the officers is to be especially given to record the qualities of all timber growing in the various districts through or near which any line shall pass, keeping in view that we can deal with the various parts of our general project on two distinct principles, considering certain portions of it as main or trunk line, and certain portions as branches. The coast line from Bombay to Surat, for example, and its direct continuation by Broach and Baroda, through the valleys of the Mahee and Chumbul to Agra, would necessarily come under the class of trunk line. It may, however, be convenient to treat the Taptee

Valley as a branch for the present; and if the timber of the above district should prove eligible and abundant, to adopt a modified course, by bringing it into rapid operation as a log tram-road at a very moderate cost, say £300 per mile.

Our mode of effecting this would be, after laying out our line very accurately, to commence at the skirts of the several jungles through which we may pass, and where fitting timber is found, and then work vigorously in both directions of our line, from those points, laying down the tram-logs at once; and I have little doubt, that if timber jungles exist there, as has been asserted, we shall, in a very short period, be enabled to open the Taptee Valley from Oomrawuttee to Surat, by a tram-road, at a cost not exceeding £300 per mile.

In selecting a line with this view, where animal power will be the force applied to the load, the levels must be even more strictly looked to than when we contemplate the application of engine power; so that there may be, in every portion of it, a distinct fall in the direction of the greatest load, which will necessarily be from inland to the sea.

16. In the early part of the cool season, it appears to be generally supposed that the jungles on the lower portion of the Taptee river are unhealthy. The employment, therefore, of the regular parties for making the trial section from Surat to Oomrawuttee must be deferred until the 1st of January, by which time the parties on the coast line will have completed their work, and may be then moved up to take the section of the Taptee line. In the mean time, however, we must not neglect that most important district, and an officer shall be selected from amongst the gentlemen who will go out by the packet of the 4th of October, to carry on a rapid preliminary *reconnaissance* of the Taptee and Nerbudda districts, in reference to the best mode of opening a road for bringing down the produce of the Charwah mineral district, to which Mr. Jacob's attention has been directed; and to report, in a general way, without taking a regular section, but recording the prevalent gradients, as to the facilities or difficulties to be met in approaching it both by the Taptee and Nerbudda line.

The officer sent on this duty must avoid remaining in unhealthy localities. He should proceed rapidly from Surat by the Taptee, until he reaches Mr. Jacob; and having consulted with him, he should return by the Nerbudda line, recording generally the inclines of the river, and the nature of the hills and their products, particularly timber, as regards the construction of the road. I have already said, that in this preliminary exploration of those two important approaches to the mineral district, he must be cautious to avoid remaining in unhealthy localities. An able officer, having a tolerable map of the district, with a clinometer and a pedometer, could lay down a tolerable proximate section of his

route, and this, together with his accompanying report, would afford most important data for regulating the subsequent operations required to obtain accurate sections and surveys.

ESTIMATES.

.17. In estimating the probable cost of our undertaking, I must explain to the engineers, that there are many most important advantages affecting the introduction of such works to India that we do not possess in England. Lord Dalhousie's experience in the railway department, at the Board of Trade, enabled him to avert from India that complication of chicanery and fraud which have characterised the operations connected with English railways, and which have heaped such crushing cost on those magnificent undertakings.

1st.—In India we have no preliminary parliamentary investigation!!!

2nd.—We are not forced to shield ourselves under the more than doubtful protection of solicitors and lawyers.

3rd.—We have nothing to fear from the cupidity of landowners, as the Government settle all claims of this nature upon an equitable scale, and have hitherto given the land required for railways gratis.

In addition to the foregoing considerations, the market price of labour is about one-sixth in India of what it is in England; and accordingly I felt justified in assuming that the average cost of Indian railways should not exceed £5,000 per mile.

In England only a portion of the expenditure could be controlled or regulated by the engineer, whilst in India every portion of it is under our control; and, therefore, our shareholders and our board of directors have a right to throw the whole responsibility upon us if the results are extravagant, whilst they must give us our due amount of merit if we are economical and successful in our operations.

NATIVE IRON MANUFACTURE.

18. We must keep clearly in mind the vast importance of the mineral district, as affecting both the time to be occupied in construction, and the ultimate cost of every mile of our great undertaking, which now contemplates more than 1,200 miles of railway, and will, doubtless, expand, by its branches, into two or three times that amount. The two great items of our expenditure will consist—1st, in the supply of iron for our roadway; 2nd, in the means by which we are to bridge our rivers and inundated grounds.

The rails and castings for a mile of single track cannot, at the present English market prices, be estimated below £2,000, although the remunerating price to the English manufacturer would not, probably, exceed £1,200. If we find good native iron in the vicinity of our line,

with labour to work it, at one-sixth of the price of English labour, it certainly is not straining the question to assume that we should be able to furnish our rails and castings from our own manufactory at the rate of £500 per mile of single track, making a saving in this item of £1,500 per mile. But it would be probably a much greater saving than this, when we consider the effect that the large prospective demand for iron to make Indian railways is likely to have in raising the present prices of English iron.

The 2nd question, of time and cost in the construction of our bridges and viaducts, is a still larger one; and if the investigations which I am about, in reference to iron pile piers, answer my expectations, I have little doubt, that besides simplifying enormously the difficulties and delays in dealing with rivers and inundated districts, the power of obtaining good native iron at first cost prices would save us, on the average of our whole line, another thousand pounds per mile. I firmly believe, therefore, that if we can establish this manufacture in our own district, we shall be enabled to complete our railway, including bridges and viaducts, at a cost not exceeding £3,000 per mile, instead of £5,000, the limitation which I had previously estimated.

19. After Mr. Jacob shall have made a sufficient exploration of the mineral district, during which period he will naturally have acquired much local information as to the general nature of the country to the northward and eastward, in the direction of the upper Nerbudda and Soane Valleys, it would be extremely desirable that he should, before the termination of the cold season, make a rapid *reconnaissance* of the upper portion of the Nerbudda Valley, and of the Soane Valley, with a view to the continuation of our railway in that direction towards Mirzapore, or other convenient point of the East Indian Railway bearing upon Calcutta. The *reconnaissance* here required would be of the same kind suggested in paragraph 16. This *reconnaissance* might possibly be made by Mr. Jacob, without arresting the progress of the mining explorations, if he could leave some one in charge of his workmen, with specific orders how to employ them till his return. His absence would not probably be protracted beyond a month or six weeks.

20. At this early period, it is desirable that every officer employed on the survey should clearly understand the principle upon which the works are to be ultimately constructed, that each may feel the necessity of becoming intimately acquainted with the productions of his district, and their cost, as well as with the price of every class of labour, and the amount of labour required to obtain certain quantities of raw material, as well as to manufacture each into their various marketable conditions, and, in short, into every combination that they may respectively undergo until they reach their permanent place in our finished work.

Such are the only true data, combined with the market price of labour in each locality, upon which an equitable estimate can be based, or by which the degree of economy or extravagance exercised in the construction of any work can be tested.

It is not the intention in our enterprise to adopt the usual course of letting off the work to a large contractor, which would, in other words, be to establish a great monopoly for the benefit of some fortunate individual, to the prejudice of the shareholders and of the public; because, in that case, the cost of the works to the company would probably reach to double the amount at which they can be executed.

The course intended is, that the company should, in fact, be their own contractors, throwing upon their engineering agency the responsibility of executing the work, without the intervention of large contractors, and thereby obliging their engineering department to make those efficient arrangements for economical construction of the works, that a great executing contractor would be enabled to make for the security of his own personal interests.

22. The engineer in chief of a company, and his numerous professional assistants, ought to be at least as capable of making sound arrangements for the company as a contractor's agent can for him. This will be required by the company from their engineers, and they will be furnished with the requisite amount of properly classified gang agency, such as a contractor would establish for the execution of his operations. The engineers will, therefore, please to keep this, our intended course of action, constantly in mind, and to collect their information and frame their estimates accordingly. They will be informed from time to time, by Mr. Jacob's reports from the mining district, as to how far they may venture to calculate upon native iron, assuring themselves that should those reports justify the efforts of the company in seeking to establish such a manufacture, no exertion shall be wanting to do so with the least possible delay; and the fullest support of the Government is looked for in aid of such an effort.

I shall likewise furnish every information, from time to time, as to how far the principle of iron pile piers may be depended upon for the bridging of rivers and lands subject to inundation. This is not, however, to prevent the officers from collecting the most accurate information on the various portions of the line, as to the mode of obtaining the utmost amount of materials for brickwork or masonry that our requirements in those respects might demand, supposing the principle of iron pile piers not applicable.

23. A weekly progress report will be required from every officer in charge of a sub-district of the work. These are to be made out in the prescribed printed form, and forwarded to the officer in charge at Surat,

for record in his office, and immediate transmission to the Secretary of the Board of Directors in London.

24. The accounts of every party are to be made up to the last day of each month, and then paid, taking regular vouchers in triplicate for every payment; and the strictest attention is to be given that no liability is to be left outstanding after the monthly pay day.

25. The regular establishment of each party will be fixed by the engineer in charge, whose office will be in or near the central point of Surat. He will thus be enabled to calculate accurately beforehand the amount of funds required for his monthly payments to each party.

CUTTING OPENINGS THROUGH JUNGLE.

26. This is not to prevent officers at a distance from employing a few extra labourers for temporary and unforeseen contingencies, such as the cutting of trees in passing through jungles, to obtain sights with the instruments—an operation, however, which must be executed with much caution, and never without a general sanction from the authorities in the territory where the survey is going on, observing that the removal of a single line of trees is the most that can be required for such a purpose; and much inconvenience and cost have been known to arise in this respect from the employment of too numerous a body of wood-cutters; half a dozen men are in general quite sufficient for this duty, when jungle intervenes in the line.

27. The best mode of obtaining cash, to make the monthly payments to each party, will probably be by the engineer in charge furnishing to each officer directing a sub-district a certificate as to the maximum monthly amount sanctioned for his party, and stating the date up to which the party has been paid; also authorising any banker or merchant to furnish him with cash within that amount monthly, taking his monthly pay account, duly certified in duplicate, as a voucher, which would be honoured on presentation at the branch of the Oriental Bank in Bombay. The merchant who gives the cash to the officers should enter a declaration upon the original certificate, stating the amount paid, and the date up to which the payment referred. Thus, the original certificate of the engineer in charge, authorising the monthly payment of each party, would likewise contain the record of the various sums drawn upon that authority, and the periods to which those payments referred, so that each successive banker or merchant applied to by an officer would at once see whether he was justified or not in disbursing the amount sought. The engineer in charge, on reaching Bombay, will communicate with the manager of the Oriental Branch Bank in that place, and settle upon the foregoing arrangement, or such modification of it as shall keep the principle in view.

CURVES.

28. It is hoped that the nature of the country may admit of curves not less than one mile radius, generally. But it is possible that certain portions may present difficulties that would render the use of much smaller radii important. It is well to keep in mind that a valuable and ingenious facility in this respect has been invented by the French engineer M. Arnoux. Mr. Kennedy, the engineer in charge, having examined and reported upon the practical working of this principle, on the Paris and Sceaux line, will be enabled to turn his experience to account, if absolutely necessary. But the principle should not be applied on our line if it can be avoided, because, if it be adopted on one portion of the line, it cannot be omitted on any portion without considerable inconvenience, and its general use ought to be avoided, if possible, as there are some disadvantages attending it.

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SCALES OF PLANS AND SECTIONS.

29. The scales upon which all plans and sections are to be taken by the engineers of the railway shall be classified as follows, viz:—

1st, for contract plan and section— .

Horizontal scale, 3 chains to 1 inch.

Vertical scale, 20 feet to 1 inch. .

2nd, for trial section—

Horizontal scale, 20 chains to 1 inch.

Vertical scale, 100 feet to 1 inch.

3rd, reduced general section—

Horizontal scale, 2 miles to 1 inch.

Vertical scale, 400 feet to 1 inch.

30. A tracing from the plotted section of the work done each fortnight must be forwarded by every officer in direction of a sub-district, to the officer in general charge at Surat, who will communicate to each officer any observations that he may deem requisite on what thus comes before him, so that all the proceedings in the various sub-districts may be kept in accordance with the general instructions. A second tracing of these fortnightly progress sections will be made out in the office of the engineer in general charge at Surat, and transmitted, together with the sub-district progress, and other reports, by each mail, to the Secretary of the Company in London. An abstract of the expenditure is likewise to be forwarded, by each mail, from the chief office at Surat, certified by the accountant and the engineer in charge, and addressed to the Secretary to the Board of Directors in London.

31. I shall, for the present, conclude by reminding my fellow-labourers that we have undertaken a task which can be beneficial only

in proportion as our principles are sound, and our practice efficient. The responsibility of engineers is higher than that of any other class of men whose efforts are directed to the mere affairs of time and mortality—second only to that of the labourers for eternity. The development of every nation's resources, and all that is connected with the material comfort of man, is extended in proportion to the judgment and fitness of the engineer's efforts; and in the precise ratio that those are successful in approaching the maximum of useful results at the minimum of cost, do we open the stores of a merciful Providence to additional myriads of our fellow mortals. The broad test of our capacity is not merely the execution of difficult undertakings in an efficient manner, but in proving that we have done all this with the smallest possible means. If we make such a practice our rule, as years increase, it will be a consolation to reflect that the pursuit of our own interests has been in unison with the interests of mankind, and that, in taking the surest course for our individual advancement, we have added to the dignity and general character of our profession.

(Signed) J. P. KENNEDY, Lieutenant Colonel,
Engineer in Chief, and Managing Director.

Weekly Progress Report, to Saturday, the 18 . . . of . . . 18 . . .
District No.
Sub-District No. Commenced Work on the . . . of . . . 18 . . .

	Quantities of Work done, stated in Miles and Chains.											Remarks.
	Flying Section.	Con- toured.	Staked out.	Levelled.	Sur- veyed.	Section Plotted.	Survey Plotted.	No. of Cross Observations	Total Right and Left.	Total Levelled and Plotted to this date.	Total Surveyed and Plotted to this date.		Cost.
	Ms. Ch.	Ms. Ch.	Ms. Ch.	Ms. Ch.	Ms. Ch.	Ms. Ch.	Ms. Ch.			Ms. Ch.	Ms. Ch.	Rs. a. p.
Total brought forward from commencement of work												
Monday												
Tuesday												
Wednesday												
Thursday												
Friday												
Saturday												
Total ..												

REMARKS.

To
LIEUTENANT COLONEL KENNEDY,
(Certified)
Engineer.

Table showing the Distribution of Engineers for the Survey of the Bombay, Baroda, and Central India Line of Railway, subject, however, to such modifications as the Officer in Charge may from time to time deem fitting.

No. of District.	Length in Miles.	From	To	Engineers' Names.	Nature of Work to be executed.
Main Trunk Line.	1	80 Bombay	Near Boree	J. P. Kennedy, Esq.	General Charge of the Survey in India.
	2	80 Near Boree	Surat	George Taylor, Esq. T. W. Rumble, Esq.	Contract Section and Survey, with Report and Estimate, to be completed by 1st January, when party are to be transferred to No. 6 District.
	3	90 Surat	Baroda	A. Mathews, Esq. H. Aher, Esq.	Contract Section and Survey, with Report and Estimate, to be completed by 1st January, when party are to be transferred to No. 7 District.
	4	230 Baroda	Central point between Baroda and Agra.	R. Handcock, Esq. R. McMahon, Esq.	Trial Section, with proximate Estimate and Report, and Plan and Report for improving Harbour near Surat, to be completed by 1st January, when party are to be transferred to aid in completion of Nos. 6 and 7 Districts.
	5	230 Central point between Baroda and Agra.	Agra	B. H. Galland, Esq. J. J. Carey, Esq.	Trial Section, with proximate Estimate and Report, to be completed by 1st April. It is desirable that the Line should pass as near to Kutlani as the nature of the ground will permit, having reference to the best gradients.
	6	200 Surat	Near Mulkapore	George Simmons, Esq. W. Galway, Esq.	Trial Section, with proximate Estimate and Report, to be completed by 1st April.
	7	180 Near Mulkapore	Nagpore by Oomrawuttee.	George Taylor, Esq. T. W. Rumble, Esq.	Trial Section, with proximate Estimate and Report, to be completed by 1st April.
	8	.. Broach	Iron District	A. Mathews, Esq. H. Aher, Esq. R. T. Plant, Esq.	Trial Section, with proximate Estimate and Report, to be completed by 1st April.
	9	.. ..	.. ..	J. T. Green, Esq.	Flying Section and Report. To ascertain proximately the general inclines, and the nature of the Country between Broach and the Iron and Coal Districts.
	10	.. ..	.. ..	A. Jacob, Esq.	Examination and Report upon the Beds of Rivers and Creeks, at the points where the Line shall cross them.
					Exploration and Report upon Nerbudda and Tapree Iron, Coal, and other minerals, with reconnaissance of Upper Nerbudda and Upper Soane Valleys, and summit between them, in reference to opening a communication with Mirzapore or other point of East India Company's Railway.

(Signed) J. P. KENNEDY, Lieutenant Colonel,
Engineer in Chief, and Managing Director.

No. of Shares issued.

In England.	In India.	Total.
123,750	26,250	150,000

APPENDIX No. II.

A Comparative View of the proximate Cost of Constructing an average Mile of Single Truck Railway by each of three methods of making the required Viaducts and Bridges, viz. 1st, by using Masonry or Brickwork; 2nd, by using English Iron; 3rd, by using Native Iron. The Embankments are assumed to average 9 feet in height to Formation Level. Average Length of Viaducts or Bridges per Mile 1-27th of the entire.

Detail of Works.	Quantities per Mile.	Estimate per Mile, supposing Viaducts and Bridges to be of					
		Masonry or Brickwork, and English Rails.			English Iron.		
		Rate per	Amount.	Rate per	Amount.	Rate per	Amount.
		£ s. d.	£	£ s. d.	£	£ s. d.	£
Surveying expenses ...	...	...	30	...	30	...	30
Law costs ...	...	...	5	...	5	...	5
Land ...	...	...	...	...	...	...	...
Fencing with growing plants	...	...	10	...	10	...	10
Earthworks ...	c. yds.	0 0 1½	363	0 0 1½	363	0 0 1½	363
Rock-cuttings ...	58,080	0 1 0	500	0 1 0	500	0 1 0	500
Bridges and viaducts ...	10,000	6 0 0	3,800	36 0 0	2,304	9 0 0	576
	lin. yds. 64						
Ballasting, 18 inches deep	c. yds.	2 6	565	0 2 6	565	0 2 6	565
	4,620						
Iron rails, sidings, switches, &c., 80 lbs. per yd.	Tons	12 0 0	1,584	12 0 0	1,584	5 0 0	660
Cast-iron sleepers ...	132	6 0 0	780	6 0 0	780	3 0 0	390
Laying permanent way, per lineal yard	130	0 0 8	58	0 0 8	58	0 0 8	58
Station-houses, 1 to every 5 miles, at £1.50 each	...	...	30	...	30	...	30
Termini and workshops ...	...	...	50	...	50	...	50
Electric telegraph ...	...	...	35	...	35	...	35
Pumps, tanks, &c. ...	...	...	70	...	70	...	70
Plant for execution of works	...	...	50	...	50	...	50

Rolling Stock.

Engines and tenders, 1 to every 10 miles, at
 £2,000
 Passenger composite carriages, 1st and 2nd class, 1
 to 10 miles, at £500
 3rd class carriages, 1 to every 3 miles, at £180
 Goods trucks, 1 to every 2 miles, at £60
 Horse boxes, 1 to every 10 miles, at £100
 Cattle trucks, 1 to every 5 miles, at £70
 Carriage trucks, 1 to every 20 miles, £100

Superintendence.

Direction in England
 Direction in India
 Engineering expenses and salaries
 Overseer's and gauger's departments

Gross Total per mile

...	...	200	...	200	...	200	...
...	...	50	...	50	...	50	...
...	...	60	...	60	...	60	...
...	...	30	...	30	...	30	...
...	...	10	...	10	...	10	...
...	...	10	...	10	...	10	...
...	...	5	...	5	...	5	...
...	...	42	...	42	...	42	...
...	...	20	...	20	...	20	...
...	...	60	...	60	...	60	...
...	...	300	...	120	...	120	...
...	...	8,717	...	7,041	...	3,999	...

APPENDIX No. III.

REPORT ON THE IRON AND COAL DISTRICTS OF THE
NERBUDDA VALLEY, FROM POONASSA TO JUBBULPORE.

TO LIEUTENANT COLONEL KENNEDY,

Engineer in Chief, and Managing Director, Surat.

Surat, April 1st, 1854.

SIR,

I have the honour to lay before you a summary of the reports and observations which I have forwarded at various times, during the five months that I have been employed in the examination of the Nerbudda mineral districts.

2. According to my instructions, I proceeded to join Mr. Keatinge, the chief British functionary of the principal mineral districts, whom I found in camp at Asseerghur, on the 19th November last, and acting under his advice, I proceeded to Kandoot, on the north bank of the river Nerbudda, where I arrived on the 30th November.

3. My attention was here directed to the iron mines belonging to Holkar, situate about four miles from the village in the dense jungle. They were in a fearfully dangerous state, no regard being paid to the workings, the aim of the people being to extract the greatest quantity of ore, without the least regard to future workings. The ore is the hydrated peroxide of iron (ochreous variety), yielding by dry assay 37·22 per cent. of iron, which may be considered as a high per-centage.

4. The most primitive form of catalan forge is used by the few poor people who earn a livelihood by the manufacture of iron. A description of their furnace may not be amiss.

It is in height from 3 to 4 feet, the top section 20 inches by 10 inches, and the bottom 23 by 22 inches. In the base of the furnace is inserted a flat earthen plate with several indentations, which are, during the smelting, pierced for the outflow of the slag. The blast is supplied through very fusible earthen pipes, by goatskins plied alternately. When these earthen pipes are burned away, the iron is finished. This

process occupies about ten hours. The base of the furnace is then broken out, the lump of iron extracted, and beaten with hammers to remove the slag; the defective apparatus used obliging them to re-heat the iron five times.

5. I hired one of these furnaces, to find what amount of iron could be extracted. I allowed the men to work in their usual method, only taking the ore and coal from heaps which I had carefully weighed. The following is the result of my investigation:—25 seers of iron ore consumed 26 seers of charcoal, and furnished 5·61 seers of iron (and this not in a marketable condition); thus giving 22·84 per cent. of iron, 104 per cent. of charcoal being consumed in the process, or at the rate of 4 tons 12 cwt. of charcoal per ton of iron.

6. A proper furnace, with this ore, could not, under the most unfavourable circumstances, consume more than 220 bushels of charcoal to the ton of iron; and taking the bushel to be 9·75 lbs., the amount of charcoal to one ton of iron would be 2,145 lbs., or 95 lbs. less than one ton, being about 4·8 times less than the quantity required by the above furnace. The above per-centage of iron appears small, when compared with my assay; but it must be remembered, that as no flux is used, every lb. weight of silex will absorb and convert into slag 3 lbs. weight of iron.

7. Each furnace has three men attached to it, who dig out the ore in the first place, next cut their timber, and burn their charcoal, then draw the ore and coal to the village, set up their furnace, and smelt their iron: during this time they must run an account with the Bunnia (or Native merchant); and such account he manages shall swallow up the produce of their labour.

The cost of manufacture is as follows:—

The ore purchased at the mines comes to 84 tokrees the rupee. I found one tokree to contain 12 lbs. nearly, the ore coming in round numbers to 4s. 6d. per ton nearly.

Three men, working at one furnace, are able to make 24 lbs. of iron per day; it therefore requires 280 men to one ton of iron by their rude process; then—

	£	s.	d.
Four tons 12 cwt. of charcoal, with 8 cwt. for waste,			
at 9s. 4d.....	2	6	8
Four and a half tons of iron ore, at 4s. 6d.	1	0	3
Labour, 280 men at 2 annas (3d.) per day each.....	3	10	0
	<hr/>		
	£6	16	11

The Bunnia's price for the iron is £7 15s. per ton, leaving him, as

above, 18s. 1d. profit per ton. As an illustration of an improvement in the manufacture of iron, even in these rough forges at Tendukera (to be described further on), where the people are rendered industrious by having a greedy and ready market for their iron, any amount may be had for 20 seers the Nagpore rupee, or £4 16s. per ton nearly, notwithstanding that they bring their charcoal from a distance of 12 gond coss, or fully 36 miles; yet, because they distribute their labour, and keep their little furnaces in regular work, they are able to give iron at the above low price, and hundreds of tons are annually sent out through the country for consumption. Their charcoal only costs them 5s. 6d. per ton at the furnace, and yet the lower Nerbudda workmen, with the timber on the spot, will charge 9s. 6d. per ton—their coalings are so very defective.

8. From Kandcoot I went to Burwayce, on the Nerbudda. Here is a large mine of the same ore as last, but more silicious. As I consider the Poonassa and the Chandghur districts of by far the greatest commercial importance, I will not say more of the intervening country.

9. I arrived at Poonassa on the 12th of December, and examined a large deposit of dolomite (carbonate of lime and magnesia), which exists there, about two miles west of the town. The deposit is, practically speaking, quite inexhaustible, the outcrop being four miles in length: the stone, for a flux, is superior to pure limestone, magnesia being a much more powerful base than lime. It is also well adapted to lithographic purposes.

10. From Poonassa I went to Chandghur, where the red hematite ore of iron abounds. It is of surpassing richness, yielding 63·4 per cent., the theoretically pure ore giving only 69·34 per cent. At one of the mines (that marked as upper Chandghur on plan), the ore lies in rounded nodules on the surface, the depth varying from 6 inches to 10 feet. It is dug out by the people with the greatest facility. This friable deposit is the result of the disintegration of the metalliferous rock beneath. I have verified this by direct observation, having laid bare several veins, by cutting trenches down on them. In addition to the above loose ore, the ground, for hundreds of acres, is strewn with it, and every stream runs down quantities of the purest kind, the *debris* from the various veins intersected in their course.

11. The river Nerbudda cuts four great veins within the short space of one mile, one of them having a breadth of 122 feet; the veins run almost vertically into either bank.

12. At Makeraban, on the river Towa, two miles from its junction with the Nerbudda, is another friable deposit, but its quality is not so good as that on the north side of the river. It is needless to dwell on

the many places in the district where iron ore abounds ; the deposit may be looked upon as inexhaustible. Since I left Poonassa Mr. Keatinge wished to find a mine close to the town, in order to employ the prisoners in the manufacture of iron, and having offered a reward of Rs. 25, he was shown two mines, which I have since examined : one of them is of much value. Your superintendent, when he would be stationed in the district, would have no difficulty in laying bare deposits, in addition to the very numerous ones which are at present known. The loose ore, which ought to be the first used, would be collected by the people of the neighbourhood : allowing the liberal price of 4 pies per tokree, the ore would be placed at the depots for the low price of 1s. 3½d. per ton. My camp was four miles from the mine, and yet the villagers offered to bring any quantity to it for that price.

13. The district, for miles round, is dense jungle ; the timber is of the highest specific gravity, including undian and stunted teak ; it is admirably suited to the manufacture of charcoal, and the supply will last for very many years. Yet it is well to know that a cheap communication can be opened with the inexhaustible coal-measures of Hoosungabad and Nursingpore (to be hereafter described), and that a line joining the coal with the iron mines would pass through a district of the most extraordinary fertility (*vide* Supplementary Report). I consider that with proper coalings, charcoal cannot possibly cost more than 4s. per ton.

14. I would furnish you with an approximate estimate of the expense of manufacturing iron at Poonassa with proper apparatus, but I consider that the fact that the inhabitants of Tendukera manufacture malleable iron for £4 16s. per ton under much less favourable circumstances, consuming more than four times the requisite quantity of fuel, to be much more valuable than any estimate I could give.

15. Poonassa I would recommend as the proper site for an iron manufactory. It possesses the following advantages :—

1st.—It is in British territory.

2nd.—The soil about it is most fertile, the place healthy, and abundantly supplied with water at all seasons.

3rd.—It is most conveniently situated with regard to trade ; the country around it flat ; and should a line from the Taptee Valley branch to Jubbulpore be deemed advisable, it would pass in the vicinity ; and the dolomite basin is close by.

16. The north bank of the river is foreign territory, and very barren ; besides, the dense jungle would render it most unhealthy.

17. Your ore banks and mines would be 10 miles distant from your works, but a proper road to them would enable you to draw the ore

very cheaply, and the road being through jungle, your coalings would be along it. One circumstance vastly in favour of these mines is, that no shaft or pumps would at any time be required, as the great veins can all be worked and drained by adits.

18. Barag Sing, one of Scindia's petty rajahs, is owner of the mines and forests on the north side of the river, and he derives a small income from them of about £10 annually.

Kurrock Sing is owner of the royalty at the south side of the river, and he derives a small income of about £3; but I am informed by the Commissioner of the Saugor and Nerbudda territories, that the Government will, in the approaching settlement, reserve all mines for their use. With these men negotiations for purchase should be opened.

19. Leaving this iron district, I proceeded to the coal-field, which I entered above Sewnee.

At Sonadeh several thin seams of coal outcrop, which, though of little value, are sufficiently indicative of a rich mine beneath, and I have no doubt but that a few deep borings would be attended with the most successful results. Here an abundance of fine fire-clay is to be had, a substance essential in the construction of your furnaces. The probable available coal-measure here will be about 15 miles long by 7 miles wide.

20. From Sonadeh I proceeded to Benar, in the Nursingpore district, eight miles to the south of Garrilwarra. Here are three workable seams, the topmost being 8 feet thick where I measured it; but as the strata were there injured, it will probably reach 10 feet. The next seam is 3 feet 6 inches, and below it another seam 6 feet 3 inches. As these are only separated by a laminated shale of 1 foot 4 inches, both seams would be wrought as one, giving an available seam of 9 feet 9 inches. Thus, about 19 feet of coal could be worked from one shaft, the intervening rock being only about 20 feet. The beds are highly inclined, owing to the occurrence of trachytic veins higher up the stream, but they will present no extraordinary difficulty in working.

21. It is highly bituminous lignite, containing little sulphur, and leaving but a small residue on incineration. Colonel Ousely, in the *Journal of the Asiatic Society of Bengal*, states that this coal was tried on the "Indus" (steamer) at Bombay, when 100 maunds did the same work as 183 of the best Glasgow coal, heating one of the boilers fifteen minutes sooner than the Scotch coal.

I carefully experimented upon the coal, and found that 100 parts gave 66·88 of coke, an average of eleven specimens from the various Newcastle collieries giving 60·77, and eight specimens from the Scotch collieries giving a mean of 54·23.

22. These seams are available throughout a large tract of country, and once a coast communication would be opened, numerous other mines would be wrought throughout this great coal formation. •

That such mines, discovered so far back as 1837, should still be untouched, speaks volumes for the state of communication through the country.

23. Leaving Benar, I went northward, to examine the iron mines of Tendukera. They are situated about six miles from the Nerbudda, in a highly cultivated district. As I before alluded to the smelting of the ore, I will confine my remarks to the mines themselves.

The ore is found beneath the surface, at depths varying from 15 to 50 feet: the pits are so carelessly made that they require to be re-dug every cold season, the monsoon rains quite filling them with the earth washed in. The ore is extracted in quite as careless a manner as at Kandcoot: the shaft is ascended and descended by huge steps cut in the clay, and though now accustomed to the various rude expedients made use of by the Natives, I was hardly prepared for the ludicrous method by which the ore is brought to the surface. A woman seats herself at the base of the shaft, and then commences throwing up the lumps of ore to step No. 1 (about 3 feet high): when this step is so covered with ore that she can but just find sitting room on it, she climbs up, repeats the process till the ore is brought to the surface; it is there placed in baskets, and carried by buffaloes to the town, three miles distant, to be smelted. I confess I was much disappointed with the ore deposit, after seeing the vast quantities of iron sent out through the district round. Though very fine red hematite ore, it is vastly inferior to the Poonassa iron, both in quality, quantity, and the facilities afforded to the working.

24. It may appear strange that this rude method of extracting the ore should be accompanied by such a neat and systematic method of smelting; but I attribute the latter to Captain Franklin's exertions, who was sent there some years since by Government, while in the former case I presume his improvements (if such be adopted) must have lapsed into disuse. At all events, the great demand for the iron through the surrounding agricultural districts has given a stimulus to the trade, while the increased competition amongst producers has reduced the price of the manufactured article.

25. Leaving Tendukera, I proceeded to examine the Jubbulpore district. Here I found large and rich deposits of the micaceous variety of specular iron: it is extensively wrought, holding the same price and position in the market as the iron of Tendukera, the principal seat of manufacture being Penaghur, 15 miles north-east of Jubbulpore. At Beltharee Ghaut, the Nerbudda cuts a large coal seam, but it is highly pyritous, and the strata being inclined at an angle of eighty degrees,

is unconformably overlain by dolomite. The difficulties presented to working the seam render it probable that no use will ever be made of it. I here found unmistakeable evidence of the presence of copper, but was unable to discover the lode. A fine statuary marble is found lower down the Nerbudda, and the whole district is of the greatest interest as well to the capitalist as to the geologist.

I have the honour to be, &c.

(Signed) ARTHUR A. JACOB, B.A.,

Assist. Engineer, and Geologist to the B. B. & C. I. R. Co.

REPORT IN REFERENCE TO THE LINE REQUIRED TO OPEN UP THE MINERAL DISTRICTS OF THE NER- BUDDA VALLEY.

TO LIEUTENANT COLONEL KENNEDY,
Engineer in Chief, and Managing Director.

Surat, April 4th, 1854.

SIR,

Having sent in my report on the mineral districts of the valley of the Nerbudda, I now beg to lay before you the result of my examination of the physical features of the country with reference to the levels, &c. in order that you may from it form a correct idea of the best means of dispersing not only the mineral, but the agricultural produce of these territories throughout India.

2. Aware of your intention of opening out the valley of the Taptec, I will speak first of the junction between Julgaum and Poonassa, the proposed site for your iron works; secondly, I will shortly refer to the line of country between Poonassa and Mundlairsir, with regard to the opening out of the lower Nerbudda Valley; and finally, I will describe the line of country between Poonassa and Jubbulpore, with a view to the connexion of the iron districts with the coal basins eastward, and to the affording of an outlet for the enormous grain and other produce of the valley, a large portion of which constantly rots for want of means of communication by which it could be brought to market. This line may also be considered as a portion of the connecting link between your main line and the Calcutta railway.

3. From Julgaum to Boorhampore is, as far as I could observe, a comparatively easy country; good gradients can, I am of opinion, be had all through it.

Boorhampore is a large, wealthy, and populous city.

The main question to be settled, on a minute examination, will be the precise point for passing the Taptee.

4. Proceeding then NE., Asseerghur should be passed at a few miles east of the fort, where the Satpoora range is much broken, and affords an easy passage. Thence to Pepleod, a distance of 15 miles, no difficulty will be found of any moment, and the country becomes more fertile; 21 miles further on the branch to your iron works would probably join, turning off towards Moondie, and crossing the Iowa on a fine rocky bottom without any difficulty: this branch would be about 16 miles in length, and probably its extension across the Nerbudda to Indore will be a matter of future consideration, opening out, as it would, the great iron country further from Poonassa.

At Sacur, where it would probably cross the Nerbudda, the fine-weather breadth of the river is but 48 feet, and I do not hesitate to say, that it affords the best site for a bridge throughout the 280 miles of that river which I have examined, save perhaps Jansee Ghaut, near Jubbulpore (to be described further on).

5. The line of country from Poonassa to Mundlaisir (about 48 miles) presents easy gradients; no difficult rivers are crossed, and Burwaye, a fine town half way, would afford considerable traffic.

6. The Nerbudda line, after passing the Poonassa junction, should diverge in a straight line to Hurda, a further distance of 28 miles. Here is the commencement of a district of endless fertility and unknown wealth, and, if the little ravines on the edges of the very few nullas to be met be excepted, the country may be considered level.

7. Hurda is a large town, carrying on a flourishing trade as far as the wretched communications of the country will admit. It sends down quantities of cotton every season to Bombay. I am informed by Mr. Keatinge, the Political Agent of Nemar, that cotton carts passed Asseerghur, during the last season, at the rate of 200 per day.

8. Crossing the Gungal river at a distance of 18 miles, Sewnec will be reached 7½ miles further on.

This is, again, a fine business town.

I would not recommend a divergence from the straight line towards Hoosingabad, as that town, though large, would not, I think, have sufficient traffic to authorise such divergence, and the river Iowa, a troublesome stream, would, near Hoosingabad, be passed with much difficulty. It would be better to continue straight to Patroda; the line would pass near the Sonadeh coal-field (see Geological Report), and it is pro-

bable that valuable coal mines will be found between Sewnee and Patroda.

9. At Patroda the Hoosingabad road is crossed : quantities of opium will here be taken up from the Baitool district, and abundance of teak timber of fine scantling can be had in the hills south of the line.

10. From Patroda to Shohagpoor is about 20 miles, the Iowa river being passed half way. This is the first troublesome river to be passed ; the bed is deep sand, and about three-quarters of a mile wide.

11. Keeping above the town of Shohagpoor, the line would still pass through a most fertile and populous country for 50 miles, when the Benar coal mine would be reached (*vide* Geological Report).

Garrilwarra lies about 12 miles north of the coal mine ; it is a fine populous town. From this to Nursingpore is 23 miles ; this is another large town.

12. From Nursingpore to Jansee will be 27 miles : the line, passing under the hills, would cross the Nerbudda at Jansee Ghaut, where a fine site for a bridge is to be obtained, about 500 yards below the Jubbulpore road.

13. The river is about 600 feet wide, and fordable ; the banks high ; the bottom is a fine flat-bedded sandstone, nearly horizontal, and should timber be required for centering or superstructure, the finest teak can be floated down from the Jubbulpore jungle.

14. There will be no ravines crossed on the south bank of the Nerbudda, as the line will run along a strip of high land between two tributaries ; but on the north bank they will be troublesome for the first half mile.

15. Twenty-three miles from this, Jubbulpore will be reached without the least difficulty.

The lateness of the season prevented me from continuing my examination towards the Ganges.

16. Throughout this whole line no gradient, I am convinced, will exceed 16 feet to the mile, and the only gradients coming at all near this are those in the vicinity of Asseerghur.

17. As a practical proof of the cheapness of provisions of every kind, I was enabled, while about the Hoosingabad and Nursingpore districts, to feed three ponies and myself for the small sum of Rs. 28 per month, and I did not act ungenerously either to myself or them.

18. The land bears two crops per year, without manure. After the monsoon, jowaree, bajree, &c. are sown, and they being removed in November, wheat, gram, linseed, &c. are sown.

The demand is so small for the grain, that it lies in deep holes in the ground for years, and frequently rots there.

Wheat may be had for 90 seers the rupee, and gram for 120 seers the rupee.

Sugar is largely sent from Mirzapore westward, and salt, English and other goods, are carried eastward.

In Jābbulpore, lac is largely manufactured for the English market, and, as I have stated in my Geological Report, its mineral resources must make it a place of vast commercial importance.

I have the honour to be, &c.

(Signed) ARTHUR A. JACOB, B.A.,

Assist. Engineer, and Geologist to the B. B. & C. I. R. Co.

APPENDIX No. IV.

REPORT ON THE TAPTEE RIVER, FROM THE VILLAGE
OF DOMUS TO KOLWAR.

BED OF THE RIVER.

From the village of Domus, at the mouth of the river, to Randeir, the upper stratum is composed of soft slime and mud, from 6 inches to 4 feet thick, over sand and gravel. A considerable thickness of this deposit occurs one mile east and west of the city of Surat, where in many places it is so soft that a man is buried to the waist in attempting to pass through it.

East of Randeir it assumes a different character, fine sand and gravel substituted for the slime deposit, the sand varying from 3 inches to 5 feet in thickness. No stones, pebbles, or boulders of any size, are observable till near the site of the village of Kupodra, where they occur in some quantities, from the size of an egg to 9 inches in diameter.

At the village of Surthana a bed of sand-stone is found, extending 150 feet from the south bank into the bed of the river, 500 feet broad, and 3 feet thick (specimen No. 1). At a distance of half a mile eastward a similar bed is found (specimens Nos. 2 and 3), 6 feet thick, 20 feet broad, and extending 80 feet from the south bank.

The upper stratum of the river bed on the north bank at this spot is fine sand 5 feet thick.

Many of the sand-banks met with are evidently shifting, and when stirred up by the action of the first flood, are carried away, to be replaced as the current subsides—frequently, however, changing their position.

It is also evident, from an inspection of the strata of one of the more permanent banks, that a very considerable deposit of alluvial matter takes place; alternate layers of sand and clay are laid regularly over each other, proving that the bed has filled in considerably, and that the action of the current is not of sufficient power to scour out the channel.

The principal deposit of this alluvial matter is, without doubt, on the delta at the mouth of the river near Domus, which has been forming for many years.

BANKS.

The south bank west of the village of Oomra is low and abrupt, in many places 2 feet above high water, rarely exceeding 10 feet, and in some so low as to admit the tide at high water over a considerable tract of land adjacent to the village of Mugdulla.

This bank is crumbling and wearing away, which is observable the whole way from Domus more or less; the north bank is low and shelving, with trifling exceptions, the entire distance to Randeir. From the village of Oomra the south bank increases in height to the city of Surat; east of which it again dips a distance of half a mile, from whence it gradually increases till, at the village of Woon, it becomes again abrupt—a character it retains to Kolwar.

The soil here is tenacious, and appears to resist the eroding action of the water, the upper stratum from 2 to 4 feet of black earth, brown clay or moorum from 30 to 40 feet, interspersed with beds of kunkur (a stone used extensively in making lime, and well adapted for ballasting) in some places 2 to 4 feet thick, and in others running in veins a few inches thick, and in detached pieces.

These remarks are equally applicable to the north bank, which is in every way similar, the height increasing or decreasing as the action of the current wears away or fills in at the re-entering angles.

EXTRAORDINARY FLOODS

Appear to occur at intervals of about five or ten years, and, as far as I can learn, extend to the north a distance of two miles, and to the south one mile from its banks, as far eastward as the village of Kolwar.

It is stated to take a period of three days to attain its highest level, remaining nearly stationary twenty-four hours, and subsides in one day, seldom exceeding in all five days.

The greatest damage sustained by the people is reported to be at the city of Surat. A large body of water coming across the country from the river near Phoolpara, a distance of two miles, enters the city at the north-east, frequently destroying the wall, and, traversing the entire town, joins the river again to the south-west. This body of water is stated to be in some places as much as 16 feet deep; on the esplanade, near the fort, 6½ feet deep; and the current so rapid in the streets that boats can scarcely make headway against it.

The velocity it is stated to acquire appears truly remarkable, when the country over which it traverses is considered, being entirely covered with thick groves of trees, gardens, cultivated land, intersected with thick hedges of considerable strength, which ought, one would suppose, to offer great resistance to the current.

To the east of Phoolpara, it is stated that at a very short distance from the river banks little or no current is felt, the water rising and falling gradually, and leaving but little deposit.

Considerable quantities of drift timber, reeds, grass, bushes, tops of houses, often with the wretched people upon them, are brought down, and numbers living on the banks find it a profitable occupation to recover this drift timber during the period of even ordinary floods.

A tree 60 feet long, the trunk $2\frac{1}{2}$ feet in diameter, still remains at the village of Phoolpara, brought down during the rainy season of last year.

One of the greatest known inundations occurred about the end of August 1837. Several are described as having taken place since, one in 1842, and in 1847, but these did not approach in magnitude the former, which is invariably alluded to by the inhabitants when speaking of these floods.

VILLAGES

The villages situated on the banks are generally out of the reach of extraordinary floods, being in most cases built upon knolls. The village of Walluck is, however, an exception, the people stating that there were three feet of water in the houses erected on the highest part of the village in the flood of 1837.

The greatest amount of damage done to these villages may, I think, be attributed to the increased population of the place, extending their habitations even below ordinary flood level, and remaining in these houses till the means of escape is cut off, when, as a last resource, they take refuge on the roof, only retarding for a few moments the destruction which but too quickly follows.

This information, and that relative to places never flooded (*vide* "Cross Sections"), have been entirely obtained from the inhabitants, and I think may generally be relied upon, because not only do they point out the highest flood marks on the banks, but state that these places have been a refuge for themselves and cattle when other parts have been submerged.

VELOCITY OF CURRENT.

The velocity was observed in three separate places in the month of February, and free from the influence of tidal water, as follows:—

At Kolwar.....	2.04 miles per hour.
At Kupodra	1.67 do.
At Phoolpara	1.45 do.

BORINGS,

To ascertain the strata of the bed of the river, were made at Kupodra, in five different places (*vide* Section C).

The clay found was in all cases stiff, and well adapted as a foundation for screw piles; the bed of sand and gravel firm and unyielding; the stones mixed with the gravel varying in size from one-eighth of an inch to 5 inches in diameter; the stratum of sand without gravel or pebbles is also very compact, and will be found a good bed for the support of screws of 4 feet flange.

In boring through the clay stratum, it took four men at the handle thirty-five turns to penetrate a depth of 6 inches.

The bed of sand, without stones, took the same number of men twenty turns for the same distance.

The bed of gravel and pebbles was particularly hard, requiring great labour, the men frequently working the whole day without advancing a foot. This, however, I attribute more to large pebbles clogging up the pipes than to anything met with likely to impede the entrance of a screw, made as I have hereafter described.

TRIAL SCREW PILES.

A wrought-iron screw made by Native workmen, 1 foot in the flange, having a wrought iron shaft 20 feet long, and 1½ inch thick, was screwed down in the bed of the river, 7 feet deep at low-water mark, at Kupodra.

It was moved round by means of cross levers keyed upon the shaft. Eight men screwed down the distance in forty minutes; beyond this they were unable to penetrate, having come upon a bed of gravel and stones.

I think it very possible this gravel bed would have been penetrated with equal facility had the opening of the flange been increased, and carried tapering to the point of the screw.

A screw made thus would, I think, have as much holding power, and the tapering flange serve to penetrate between the stones, and thrust them on one side.

After penetrating the upper stratum, two feet thick, I found every turn of the lever sent the shaft down an inch, or twelve turns to a foot.

A longitudinal section of the Taptee river from Domus to Kolwar, six cross sections, and specimens of the different strata penetrated in the borings, also of stone found near the village of Surthana, accompany this report.

(Signed) J. T. GREEN,
First Assistant Engineer.

Surat, 13th March 1854.

REPORT ON THE NERBUDDA RIVER.

BANKS.

The north bank, east and west of Broach, is high and precipitous, showing evident indications of the encroachment of the river during the period of floods; and, by information obtained from the inhabitants, this wearing away is to the extent of 30 feet in a period of twenty years. The upper stratum of this bank is black earth, 3 to 4 feet thick, under which are alternate layers of sand and clay, varying from 2 to 8 feet thick, mixed with kunkur. (Specimen forwarded.)

Twelve feet from the bed of the river the clay becomes hard and tenacious, and appears to resist the action of the flood very considerably.

The south bank is low and shelving, about 21 feet above the summer level of river; the upper stratum alluvial deposit of earth and sand, in parts cultivated, and in others covered with low jungle, extending a distance of more than a mile to a former channel of the river, when the bank again rises abruptly.

FLOODS

Are of two descriptions—those occurring annually during the periodical rains, and rapid freshes at the same season, owing, probably, to the combined influence of a heavy fall of rain, strong westerly wind, and high spring tides.

The highest known rise of flood took place seventeen years since, by the account of the inhabitants, and appears to correspond with the great flood mentioned in the report of the Taptee river, namely in the month of August 1837. The country in the vicinity of the river is spoken of as being entirely under water, except solitary knolls, upon which human beings and cattle congregated. This inundation, similar to the Taptee river, took a period of three days to attain its greatest height, and subsided in one, remaining nearly stationary twenty-four hours. With regard to the extent of country which was flooded, no positive information can be obtained: there is a prevalent report that the waters of the Taptee and Nerbudda joined, which, if true, would make it about forty miles.

Large quantities of drift timber, grass, bushes, tops of houses, cattle, &c. are brought down during the period of periodical floods, and which is considerably increased upon a sudden rise in the river: tigers, bears, and several descriptions of deer, are also frequently brought down, together with a large number of snakes.

The nature of the deposit, after the floods have subsided, is alternate layers of sand and clay, as regularly as if deposited by human aid; some of the layers vary in thickness, owing to the freshes being less at one time than another.

VELOCITY OF CURRENT.

The velocity was observed when the river was free from tidal water, and at summer level, the means of three observations gives 1.23 feet per second, or 4,428 feet per hour—less than one mile.

BORINGS

Have been made in four places, one on the north side, between high and low water, one in the centre of the river, and two on the south side. A reference to the accompanying section will explain the different strata penetrated: no stones, gravel, or pebbles were met with on the north side—the clay is very tenacious; the sand and gravel found in the centre boring is compact and firm; that on the south side becomes firm after the first 10 feet are passed through, and I have no hesitation in stating that screws of 4 feet flange will both enter the different strata with facility, and at a depth of 20 feet be found to afford a good and sufficient support for any structure.

The drift timber brought down in inundations is of considerable size and quantity, and on this account I would beg to suggest that the water may be left as wide as possible—a span of 80 feet would not, I conceive, be more than sufficient. The number and size of piles used in each pier will of course be regulated by the span decided upon, and consequent weight to be borne by such pier: cylindrical tubular piles of wrought iron, with screws of 4 feet flange, will, I believe, be found the best adapted for piers in both the Taptee and Nerbudda rivers—the modification to be made in the screw used in the former, as described in the report thereon.

(Signed) J. T. GREEN,
First Assistant Engineer.

Surat, 4th April 1854.

APPENDIX No. V.

Statement of the Value of Import and Export Trade at each of the Ports in Guzerat, during the Year 1852-53.

Ports.				Imports Value.	Exports Value.	Total Value.
Bugwarra	..	..	.	9,812	1,08,113	1,17,925
Bulsar	..	..	..	1,53,457	8,55,415	10,08,872
Gundevce	..	..	..	721	59,159	59,880
Nowsaree	..	..	..	264	4,852	5,116
Surat	..	..	..	30,90,781	33,96,689	64,87,470
Broach	..	..	..	16,43,970	24,55,787	40,99,757
Tankaria	..	..	..	2,12,282	29,87,864	31,00,146
Cambay	..	..	.	2,84,806	2,72,982	5,57,788
Bowleearee	..	.	.	9,67,516	5,43,122	15,10,638
Khoon	..	..	..	37,26,624	45,05,675	82,32,299
Bhownuggur	..	..	..	2,69,998	6,36,475	9,06,473
Gogo	..	..	..	54,60,161	35,34,957	89,95,118
Total . Rs.				1,58,20,392	1,93,61,090	3,51,81,482
Total .. £				1,582,039	1,936,109	3,518,148

APPENDIX No. VI.

SCHEDULE OF GRADIENTS.

Main Line, Bassein Alternative.

District.	Distance				Length of Gradient		Inclination.
	From		To		Ms.	Chs	
	Ms	Chs	Ms.	Chs			
Darsaith to Bombay .	....		9	0	9	0	Horizontal
	9	0	13	0	4	0	1 in 918
	13	0	16	42	3	42	1 in 930
	16	42	19	74	3	32	Horizontal
	19	74	23	0	3	6	1 in 1249
	23	0	25	50	2	50	1 in 500
	25	50	28	62	3	12	1 in 4488
	28	62	31	54	2	72	Horizontal
	31	54	35	39	3	65	1 in 696
	35	39	41	32	5	73	1 in 1486
	41	32	47	31	6	2	1 in 3181

Main Line.

No. 1.	....		0	34	0	34	Horizontal
Callian to Bordee ..	0	34	1	68	1	34	1 in 370
	1	68	3	36	1	48	Horizontal
	3	36	4	73	1	36	1 in 383
	4	73	6	62	1	70	1 in 427
	6	62	8	0	1	18	1 in 2151
	8	0	11	0	3	0	1 in 360
	11	0	11	65	0	65	Horizontal
	11	65	12	45	0	60	1 in 330
	12	45	14	60	2	15	1 in 1155
	14	60	15	26	0	46	1 in 376
	15	26	20	77	5	50	1 in 502
	20	77	23	23	2	25	1 in 532
	23	23	24	23	1	0	1 in 486
	24	23	27	19	2	75	1 in 990
	27	19	31	24	4	5	Horizontal
	31	24	40	0	8	56	1 in 2871
	40	0	45	0	5	0	1 in 2640
	45	0	46	0	1	0	Horizontal
	46	0	48	0	2	0	1 in 406
	48	0	52	0	4	0	1 in 880

District.	Distance.				Length of Gradient.		Inclination.
	From		To		Ms.	Chs.	
	Ms.	Chs.	Ms.	Chs.			
No. 1. Callian to Bordee, continued.	52	0	57	0	5	0	1 in 677
	57	0	60	0	3	0	1 in 1056
	60	0	61	0	1	0	1 in 825
	61	0	64	0	3	0	1 in 807
	64	0	65	45	1	0	1 in 393
	65	45	67	0	1	0	1 in 2530
	67	0	69	0	2	0	1 in 340
	69	0	74	66	5	66	1 in 709
No. 2. Bordee to Surat ...			4	0	4	0	1 in 1173
	4	0	5	0	1	0	1 in 660
	5	0	10	0	5	0	Horizontal
	10	0	12	0	2	0	1 in 960
	12	0	17	0	5	0	1 in 4400
	17	0	18	28	1	28	1 in 795
	18	28	20	8	1	60	1 in 400
	20	8	25	0	4	72	1 in 1320
	25	0	26	42	1	42	1 in 447
	26	42	33	0	6	38	1 in 2850
	23	0	35	0 _n	0	2	1 in 880
	35	0	37	0	0	2	1 in 1760
	37	0	38	0	0	1	1 in 330
	38	0	43	0	0	5	1 in 628
	43	0	48	0	0	5	1 in 825
	48	0	52	0	0	4	1 in 1242
	52	0	57	0	0	5	1 in 2400
	57	0	60	0	0	3	Horizontal
	60	0	62	0	0	2	1 in 528
	62	0	66	43	4	43	1 in 1996
	66	43	67	42	0	79	1 in 528
	67	42	72	0	4	38	1 in 1072
	72	0	74	0	2	0	1 in 5280
	74	0	78	0	4	0	1 in 3960
	78	0	85	0	7	0	1 in 6160
No. 3. Surat to Baroda ..			9	0	9	0	Horizontal
	9	0	11	0	2	0	1 in 704
	11	0	13	0	2	0	1 in 704
	13	0	15	0	2	0	1 in 3520
	15	0	18	0	3	0	1 in 7920
	18	0	21	0	3	0	1 in 452
	21	0	28	31	7	31	1 in 1950
	28	31	33	0	4	49	1 in 974
	33	0	37	15	4	15	Horizontal
	37	15	41	0	3	65	1 in 1000
	41	0	48	0	7	0	Horizontal
	48	0	54	0	6	0	1 in 1320
	54	0	59	0	5	0	1 in 3330
	59	0	63	0	4	0	1 in 3017
	63	0	73	0	10	0	Horizontal
	73	0	81	26	8	26	1 in 1515 ..

District.	Distance.				Length of Gradient.		Inclination.
	From		To		Ms.	Chs.	
	Ms.	Chs.	Ms.	Chs.			
No. 4.	.....		0	41	0	41	Horizontal
Baroda to Neemuch..	0	41	4	0	3	39	1 in 2310
	4	0	8	75	4	75	1 in 2172
	8	75	15	2	6	7	1 in 802
	15	2	21	12	6	10	1 in 490
	21	12	23	46	2	34	1 in 443
	23	46	26	27	2	61	1 in 972
	26	27	28	21	1	74	Horizontal
	28	21	31	40	3	19	1 in 681
	31	40	36	7	4	47	1 in 411
	36	7	37	36	1	29	1 in 654
	37	36	39	17	1	61	1 in 547
	39	17	42	26	3	9	1 in 365
	42	26	45	50	3	24	Horizontal
	45	50	53	36	8	66	1 in 221
	53	36	56	39	3	3	1 in 246
	56	39	64	57	8	18	1 in 304
	64	57	69	24	4	47	Horizontal
	69	24	71	76	2	52	1 in 330
	71	76	75	0	3	4	1 in 120
	75	0	79	37	4	37	1 in 120
	79	37	86	65	7	28	Horizontal
	86	65	92	58	5	73	1 in 279
	92	58	97	59	5	1	1 in 3292
	97	59	100	46	2	67	1 in 557
	100	46	103	10	2	44	1 in 175
	103	10	105	48	2	38	1 in 120
	105	48	108	19	2	51	1 in 278
	108	19	110	44	2	25	1 in 258
	110	44	113	44	3	0	Horizontal
	113	44	115	78	2	34	1 in 145
	115	78	117	78	2	0	1 in 358
	117	78	124	19	6	21	1 in 120
	124	19	128	3	3	64	1 in 330
	128	3	132	4	4	1	1 in 530
	132	4	135	3	2	79	1 in 528
	135	3	136	4	1	1	1 in 880
	136	4	140	20	4	16	1 in 255
	140	20	149	23	9	3	1 in 238
	149	23	154	50	4	27	1 in 207
	154	50	158	59	4	9	1 in 116
	158	59	165	54	6	75	1 in 1465
	165	54	169	59	4	5	1 in 344
	169	59	174	60	5	1	1 in 347
	174	60	178	33	3	73	1 in 209
	178	33	180	63	2	30	1 in 656
	180	63	183	0	2	17	1 in 330
	183	0	184	53	1	53	1 in 1254
	184	53	194	52	9	79	1 in 878
	194	52	197	18	2	46	1 in 330
	197	18	198	41	1	23	Horizontal

District.	Distance.				Length of Gradient.		Inclination.
	From		To		Ms.	Chs.	
	Ms.	Chs.	Ms.	Chs.			
No. 4. Baroda to Neemuch, <i>continued.</i>	198	41	201	72	3	31	1 in 330
	201	72	204	0	2	8	1 in 852
	204	0	208	0	4	0	1 in 330
	208	0	210	0	2	0	1 in 754
	210	0	215	0	5	0	1 in 330
	215	0	218	0	3	0	1 in 580
	218	0	221	0	3	0	1 in 660
	221	0	223	0	2	0	1 in 330
	223	0	228	0	5	0	1 in 1056
	228	0	229	0	1	0	Horizontal
	229	0	230	0	1	0	1 in 1760
	230	0	232	0	2	0	1 in 330
	232	0	234	0	2	0	1 in 1056
	234	0	235	0	1	0	1 in 528
	235	0	237	0	2	0	1 in 330
	237	0	239	0	2	0	1 in 660
	239	0	241	57	2	57	
No. 5. Neemuch to Agra			1	0	1	0	Horizontal
	1	0	9	0	8	0	1 in 398
	9	0	16	0	7	0	1 in 445
	16	0	19	0	3	0	1 in 1980
	19	0	20	46	1	46	1 in 519
	20	46	23	0	2	34	1 in 330
	23	0	26	14	3	14	1 in 16830
	26	14	27	0	0	66	1 in 330
	27	0	32	40	5	40	1 in 374
	32	40	35	0	2	40	Horizontal
	35	0	37	2	2	2	1 in 1782
	37	2	38	7	1	5	1 in 431
	38	7	43	17	5	10	1 in 1173
	43	17	45	29	2	12	1 in 2854
	45	29	46	26	0	77	1 in 635
	46	26	48	0	1	54	Horizontal
	48	0	51	0	3	0	1 in 396
	51	0	53	41	2	41	1 in 631
	53	0	59	0	5	39	Horizontal
	59	0	61	0	2	0	1 in 482
	61	0	62	0	1	0	Horizontal
	62	0	66	0	4	0	1 in 4224
	66	0	67	0	1	0	1 in 366
	67	0	67	60	0	60	Horizontal
	67	60	69	10	0	30	1 in 164
	69	10	70	0	0	70	1 in 462
	70	0	73	10	3	10	1 in 435
	73	10	76	10	3	0	1 in 330
	76	10	80	69	4	59	1 in 1791
	80	69	84	38	3	49	1 in 2114
	84	38	86	37	1	79	1 in 330
	86	37	90	0	3	43	1 in 622
	90	0	94	0	4	0	Horizontal

District.	Distance.				Length of Gradient.		Inclination.
	From		To		Ms.	Chs.	
	Ms.	Chs.	Ms.	Chs.			
No. 5. Neemuch to Agra, continued.	94	0	99	62	5	62	1 in 500
	99	62	102	0	2	18	1 in 3916
	102	0	104	0	2	0	1 in 406
	104	0	107	0	3	0	1 in 3960
	107	0	111	0	4	0	1 in 782
	111	0	115	0	4	0	1 in 422
	115	0	117	0	2	0	1 in 5280
	117	0	121	58	4	58	
	121	58	123	63	2	5	Horizontal
	123	63	128	0	4	17	1 in 330
	128	0	135	0	7	0	1 in 331
	135	0	141	0	6	0	1 in 660
	141	0	144	0	3	0	1 in 1242
	144	0	148	0	4	0	1 in 2112
	148	0	150	0	2	0	1 in 330
	150	0	152	0	2	0	1 in 459
	152	0	155	0	3	0	1 in 2263
	155	0	162	0	7	0	1 in 330
	162	0	164	0	2	0	1 in 621
	164	0	168	40	4	40	1 in 1131
	168	40	172	0	4	40	1 in 449
	172	0	175	0	3	0	Horizontal
	175	0	177	0	2	0	1 in 330
	177	0	178	62	1	62	Horizontal
	178	62	180	0	1	18	1 in 330
	180	0	181	62	4	62	1 in 330
	181	62	186	0	1	18	Horizontal
	186	0	195	0	9	0	1 in 848
	195	0	197	0	2	0	1 in 330
	197	0	202	0	5	0	1 in 330
	202	0	206	0	4	0	1 in 570
	206	0	209	0	3	0	1 in 1980
	209	0	210	0	1	0	1 in 1760
	210	0	211	0	1	0	1 in 480
	211	0	214	0	3	0	1 in 386
	214	0	216	0	2	0	1 in 660
	216	0	218	0	2	0	1 in 1760
	218	0	219	0	1	0	1 in 750
	219	3	220	0	1	0	1 in 330
	220	0	222	0	2	0	Horizontal
	222	0	225	0	3	0	1 in 330
	225	0	227	0	2	0	1 in 2640
	227	0	232	0	5	0	1 in 2932
	232	0	234	0	2	0	1 in 812
	234	0	238	0	4	0	1 in 760
	238	0	241	0	3	0	1 in 634
	241	0	243	0	2	0	1 in 1503
	243	0	244	0	1	0	1 in 2640
244	0	246	0	2	0	1 in 2640	
246	0	247	0	1	0	1 in 440	
247	0	249	0	2	0	1 in 330	

District.	Distance.				Length of Gradient.		Inclination.
	From		To				
No. 5. Neemuch to Agra, <i>continued.</i>	Ms.	Chs	Ms.	Chs.	Ms.	Chs.	
	249	0	250	0	1	0	1 in 330
	250	0	254	0	4	0	1 in 542
	254	0	257	0	3	0	1 in 495
	257	0	259	0	2	0	1 in 10560
	259	0	260	0	1	0	1 in 480
	260	0	261	0	1	0	1 in 1056
	261	0	262	0	1	0	1 in 1056
	262	0	264	0	2	0	1 in 1760
	264	0	265	0	1	0	Horizontal
	265	0	266	0	1	0	1 in 528
	266	0	268	0	2	0	1 in 546
	268	0	269	0	1	0	1 in 1320
	269	0	270	0	1	0	1 in 377
	270	0	276	0	6	0	Horizontal
	276	0	279	0	3	0	1 in 1584
	279	0	282	0	3	0	1 in 609
	282	0	295	0	3	0	1 in 4290
	291	0	300	0	5	0	1 in 6600
300	0	308	0	8	0	1 in 4224	

Taptee Valley Branch.

No. 1. Surat to Essurwaree..	2	21	2	21	2	21	1 in 568
	5	5	5	5	2	61	1 in 776
	8	68	8	68	3	63	1 in 2003
	9	79	9	79	1	11	1 in 1501
	11	70	11	70	4	71	1 in 887
	21	15	21	15	6	25	1 in 5560
	22	43	22	43	1	28	1 in 1406
	25	1	25	1	2	38	1 in 1302
	31	33	31	33	6	32	1 in 676
	34	49	34	49	3	16	1 in 338
	38	73	38	73	4	24	1 in 1078
	41	15	41	15	2	42	1 in 1200
	50	14	50	14	8	79	1 in 330
	52	45	52	45	2	31	1 in 333
	56	28	56	28	3	63	1 in 302
	58	26	58	26	1	78	1 in 2085
	62	28	62	28	4	2	1 in 330
	68	1	68	1	5	53	1 in 1362
	70	22	70	22	2	21	1 in 330
	74	77	74	77	4	55	1 in 428
No. 2. Essurwaree to Amulnair.	78	49	78	49	3	52	1 in 800
	..	..	2	34	2	34	1 in 1067
	2	34	4	9	1	55	1 in 2970
	4	9	6	74	2	65	1 in 552
	6	74	9	40	2	46	1 in 375
	9	40	14	18	4	50	1 in 1134
	14	18	18	43	4	25	1 in 366
	18	43	22	49	4	6	1 in 556
	22	49	29	28	6	59	1 in 658

District.	Distance.				Length of Gradient.		Inclination.	
	From		To					
	Ms.	Chs.	Ms.	Chs.	Ms.	Chs.		
No. 2. Essurwaree to Amulnair, continued.	29	28	32	8	2	60	1 in 1210	
	32	8	35	57	3	69	1 in 657	
	35	57	41	59	6	2	1 in 2651	
	41	59	45	38	3	50	1 in 1315	
	45	38	49	0	3	42	1 in 715	
	49	0	52	0	3	0	1 in 495	
	52	0	56	0	4	0	1 in 330	
	56	0	61	0	5	0	1 in 910	
	61	0	64	0	3	0	Horizontal	
	64	0	66	0	2	0	1 in 1320	
	66	0	68	0	2	0	1 in 2640	
	68	0	74	0	6	0	1 in 5280	
	74	0	76	0	2	0	Horizontal	
	76	0	78	0	2	0	1 in 352	
	78	0	82	49	2	49	1 in 553	
82	49	85	15	2	46	1 in 330		
No. 3. Amulnair to Julgaum.	..		2	53	2	53	1 in 369	
	2	53	5	36	2	63	1 in 1471	
	5	36	7	21	1	65	1 in 870	
	7	21	9	45	2	24	1 in 313	
	9	45	14	55	5	10	1 in 346	
	14	55	16	5	1	30	1 in 7194	
	16	5	20	0	3	75	1 in 330	
	20	0	24	7	4	7	1 in 723	
	24	7	27	0	2	73	1 in 3811	
	27	0	30	5	3	5	1 in 808	
	30	5	33	0	2	75	1 in 553	
	33	0	34	35	1	35	1 in 843	
	34	35	36	0	1	45	1 in 440	
	Ahmedabad Branch							
	No. 1. Baroda to Ahmedabad.	..		2	0	2	0	Horizontal
2		0	6	0	4	0	1 in 5280	
6		0	7	11	1	11	1 in 5280	
7		11	8	0	0	69	1 in 1518	
8		0	9	0	1	0	1 in 1760	
9		0	11	0	2	0	1 in 704	
11		0	15	0	4	0	1 in 2640	
15		0	17	0	2	0	1 in 1173	
17		0	19	0	2	0	1 in 5280	
19		0	20	78	1	78	1 in 554	
20		78	23	0	2	2	1 in 391	
23		0	27	33	4	33	1 in 4659	
27		3	28	58	1	25	1 in 770	
28		58	30	0	1	22	1 in 3366	
30		0	31	0	1	0	Horizontal	
31		0	35	0	4	0	1 in 1408	
35		0	40	32	5	32	1 in 5715	
40		32	42	0	1	48	1 in 441	
42		0	47	0	5	0	1 in 1800	

District.	Distance.				Length of Gradient.		Inclination.
	From		To				
No. 1. Baroda to Ahmedabad, <i>continued.</i>	Ms.	Chs.	Ms.	Chs.	Ms.	Chs.	
	47	0	51	0	4	0	1 in 8778
	51	0	54	0	3	0	Horizontal
	54	0	58	0	4	0	1 in 1625
	58	0	65	0	7	0	1 in 1827
	65	0	66	0	1	0	1 in 1056
	66	0	67	65	1	65	1 in 4818
	67	65	70	76	3	11	1 in 1494
	70	76	73	21	2	25	1 in 814

No. 118 of 1854.

FINANCIAL DEPARTMENT
(*Railway Branch*).

To H. E. GOLDSMID, Esq.,
Officiating Chief Secretary to Government.

SIR,

I have the honour to inform you, that I have carefully perused and studied the documents submitted for the consideration of Government, with a letter dated 28th April 1854, from Lieutenant Colonel Kennedy, Managing Director and Engineer in Chief of the proposed Bombay, Baroda, and Central India Railway.

2. These documents consist of—

1st.—Colonel Kennedy's general Report to the Directors of the proposed Railway Company.

2nd.—Six Appendices, illustrative or explanatory of the same.

3rd.—A general Map, showing the several projected lines and branches.

4th.—And also several rolls of Tracings of Sections of various portions of them.

3. The whole scheme embraced in these papers is a most extensive one : it is, as set forth in paragraph 3, "the opening of the most effectual general line of intercourse from Bombay, the great western capital and sea-port of India, through the Central and North-Western Districts,* to meet the railway in progress of construction from Calcutta to Delhi, together with all the branches that such a line could require."

4. It is suggested that the main line should proceed in a direction due north from Bombay to Surat, Broach, and Baroda, and this much of it is considered as fixed ; but that although a section is given of the country from Baroda on to Agra *viâ* Godra, Dohud, Neemuch, Chittore, Tonk, and Hindwa, this is only to be considered as a trial section, and that it remains open for future consideration whether the alternative line

* These districts are now so well known in India as the "North-Western Districts," a designation they have obtained, I presume, from their position with reference to Calcutta and the seat of the Supreme Government, that little confusion is likely to arise in this country from alluding to them under that title wherever the writer may happen to be situated at the time ; but now that questions respecting Indian railways are obtaining so much greater notice at home, it would certainly be convenient if some designation could be found for them which would save the apparent absurdity of a writer in Bombay speaking of the North-West Provinces, when he is, in fact, alluding to territories situated to the north-east of his position.

from Baroda to Delhi *viâ* Ahmedabad, Pultun, Deesa, Palee, and Ajmere, should not be adopted in preference.

5. If the general project of opening a communication by railway with these provinces is entertained, I fully concur with Colonel Kennedy, that so much of the scheme as is included between Bombay and Baroda must be considered as determined. The geographical features of the country alone are sufficient to limit it to this line. I am not, however, prepared to say that Colonel Kennedy's is the best possible route for opening a communication between Agra and Bombay, because the surveys of the Great Indian Peninsula Railway Company of their extension to the north-east are not yet sufficiently advanced to admit of a comparison between Colonel Kennedy's proposal and any line they may strike out being made. Should, however, the traffic of the provinces that would be opened by Colonel Kennedy's alternative line from Baroda to Delhi *viâ* Ahmedabad, Deesa, &c. be considered of sufficient importance to sanction the commencement of a railway in that direction, the necessity for any immediate decision between the two would not exist: the two lines would be so far separated, and traverse such entirely distinct portions of the country, that they could not be looked upon in any light as competing lines—there would be ample room for both.

6. It is evident, however, from a perusal of the 58th paragraph of the Report, that the first object sought by the Bombay, Baroda, and Central India Railway Company, is the opening of the branch from Surat *viâ* the Valley of the Taptee into Khandeish, and onwards to the site of the proposed iron foundry at Poonassa, and thence to the Benar coal-fields. A reference to paragraph 38 will show, that beyond the town of Julgaum in Khandeish, Colonel Kennedy has not executed any survey; but finding, upon his arrival there, the engineers of another company (*i. e.* the Great Indian Peninsula Railway Company) occupied on the onward route, and deeming it superfluous to make a duplicate section of the country, he placed his party elsewhere. Until, therefore, the surveys now in progress by the Great Indian Peninsula Railway Company are received, the question of the onward course from Julgaum must be allowed to lie over. I may, however, notice here, that not only does the testimony of Colonel Kennedy and his assistant, Mr. Jacob, agree as to the facility of constructing a good line on from Julgaum to the site of the foundry and the Benar coal-fields, but from what I have learnt of the progress making by the officers of the Great Indian Peninsula Railway Company in the actual survey of the district, there is every reason to believe that these favourable anticipations will be realized.

7. Government are aware that the further progress of the Great

Indian Peninsula Railway in a north-easterly direction has been altogether suspended, and that the works, further than is sufficient to bring the present short line to a practicable terminus on the Thull Ghaut road, are entirely at a stand still. This suspension is consequent on the recommendation to the Honorable Court contained in Section 4 of paragraph 54 of a Minute by the Most Noble the Governor General on Railways in India, dated 20th April 1853, to the effect that "the Thull Ghaut line to Khandeish shall not be sanctioned until a survey shall have been made of the line recommended by the Taptee, and the Honorable Court shall have decided between the Ghaut and river lines."

8. I need hardly remind you that this Taptee Valley line was recommended to the notice of the Honorable Court by Colonel Kennedy in a Memoir dated 14th September 1852, and to which Memoir I had the honour to offer a reply in my letter to your address dated January 31st 1853. The objections I then offered to Colonel Kennedy's suggestion were admitted to have considerable weight in determining the rival claims between the direct route to Khandeish *viâ* the Thull Ghaut, and the more circuitous one *viâ* the Taptee Valley. I would here quote portion of paragraph 47 of the Minute by the Most Noble the Governor General :—

"Again, I conceive that Captain Crawford has built up a very strong presumptive case against the practical correctness of Major Kennedy's opinion that Khandeish ought to be opened up by a railway taking the line of the Taptee river. The length of such a river line is shown to be very much greater, the difficulties of construction would apparently be very serious, and the sources of traffic along it few and scanty."

Actual observation during the past season has fully confirmed my previous opinion on this subject.

9. So much delay has occurred in the prosecution of the works of the Great Indian Peninsula Railway Company, that although this subject of the Taptee Valley line may, as regards the main question of opening a communication between Bombay and Delhi or Agra, be considered as of secondary importance, it is by no means so, either as regards general railway progress on this side of India, or the commercial views of this port in obtaining an immediate railway communication with a fertile province, lying within a distance of from 200 to 300 miles. The perfecting of the means of communication between Bombay and Khandeish has been, I have reason to believe, a subject constantly and urgently pressed upon the notice of Government for years past. Feeling it, therefore, to be of so great immediate importance, I shall, before considering further the whole of the general project now put forward by Colonel Kennedy on the part of the Bombay, Baroda, and Central India Railway Company, of which he is Managing Director,

discuss this question of the communication with Khandeish by itself, in order that a decision as to the route *viâ* the Thull Ghaut or Taptee Valley may be come to with as little delay as possible.

10. Colonel Kennedy has carried his reconnoitring survey up through the Northern Konkun to Surat, and thence *viâ* the Taptee Valley to the town of Julgaum in Khandeish, situated in the centre of a fertile cotton district. The surveys by the Great Indian Peninsula Railway Company already submitted for consideration have set out a line *viâ* the Thull Ghaut and Nassick to Munmar, at the entrance of the province of Khandeish, and the present season's surveys have continued this line on through the province by the Valley of the Girnah to the town of Julgaum. It is evident, therefore, that as both routes have attained the same point, their relative merits may now be fairly discussed. The question, then, is, taking all points into consideration, whether it is preferable to open the route between Bombay and Khandeish by the direct line *viâ* the Thull Ghaut, or by the circuitous one *viâ* the Taptee Valley? I am aware that this statement of the case may be objected to, and that it may be advanced by the advocates of the Taptee Valley route, that the portion of the line from Bombay to Surat being obligatory upon them, as a part of their grand trunk line to Agra or Delhi, it is only the comparatively short branch from Surat to Julgaum which will have to be taken into consideration as regards their project. In this view of the case, however, I cannot concur. We must go back to the origin of the railway project in Bombay, and remember that the first company was formed, and their capital subscribed, with the distinct and legitimate object of opening a direct communication between Bombay and the cotton districts of Khandeish and Berar. It was not sought or desired to bring the produce of these districts down by a circuitous route to the port of Surat. If, after the community of Bombay have obtained their object in opening a direct communication with Khandeish, the Bombay, Baroda, and Central India Railway Company should still think there existed sufficient inducement to push a branch line from Surat up the Valley of the Taptee, and should it be considered that the physical nature of the district would not be hostile to such a project (of which more hereafter), Government may, perhaps, be induced to grant them permission to do so: all I would object to is this circuitous route being adopted in supersession of the direct one; and I shall now proceed to state, as clearly as I can, the comparative merits and demerits of the two routes.

11. Knowing that the question of the route to Khandeish, though by many considered as of secondary importance, when taken in connection with the general project for railways for the whole of India, was one of immediate consequence to the community of Bombay, and to the

present state of railway affairs in this Presidency, I took the earliest opportunity, at the commencement of the present year, to inspect personally the two proposed routes, and for this purpose proceeded by the direct line of the Thull Ghaut *viâ* Nassick to Khandeish, through that province to Julgaum, and thence, crossing the Taptee, I visited Asseerghur, up to which point the line of the Great Indian Peninsula Railway had then been laid out. I returned by the north bank of the Taptee to Thalneir, crossed from that to Dhoolia, and proceeded from thence to the Nundoorbar districts, and through the western jungles *viâ* Essurwaree and Soneghur to Surat. From Surat I came down to Bulsar, and through the Northern Konkun, taking the inner line from Boree to Bhewndy.

12. Having given the whole subject the fullest consideration, I think I can with all confidence recommend that the direct route *viâ* the Thull Ghaut be selected for opening a communication by railway between Khandeish and Bombay, in preference to the circuitous one by Surat and the Valley of the Taptee, on the following grounds:—

1st.—The Thull Ghaut line is to be preferred to that by Surat and the Taptee Valley, in that it is the most direct.

2nd.—That it occupies the route by which the traffic of the country is at present conducted.

3rd.—That, omitting the Ghaut ascent as an exceptional case, it is mile for mile a cheaper line to construct.

4th.—That, intermediately between Bombay and Julgaum, there are more places and localities on the Thull Ghaut line with which it is desirable to open communication than on the other route.

5th.—That there is every reason to expect that it will be throughout a paying line.

6th.—That it passes through a healthy country.

13. With regard to the 1st point of preference, I have had occasion already to speak in my letter No. 17, of 31st January 1853. I then compared the two routes, assuming Sowda in Khandeish as the terminus common to both. This was, however, before either party had carried their surveys into Khandeish: as they have now done this, and both arrived at the common point, Julgaum, I shall once more compare the two routes with the greater precision of ascertained distances.

14. A glance at the accompanying map, in which the direct route is coloured *red*, and that by the Taptee Valley *black*, will show, that whilst by the first the traffic would be conducted along the hypotenuse of a right-angled triangle, 260 miles in length, by the latter it would have to pass along the two sides of the same triangle, 390 miles in length. I have here assumed the distance from Bombay to Surat at 190 miles, as taken from the Quartermaster General's Route-book, as it

is not yet determined whether this line, if made, will be taken *via* Callian, or the alternative one by Bassein.

15. Mile for mile, with the exception of the Thull Ghaut incline, the direct route will, I am certain, prove the cheapest to construct; but allowing, for the moment, that the cost of construction on either line is mile for mile the same, we have Surat and Taptee Valley.. Miles 390

Thull Ghaut line	260
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Difference in favour of Thull Ghaut line	130
--	-----

Say at £7,000 per mile	<u>£910,000</u>
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But from this must be deducted the difference of cost between the Thull Ghaut incline and an equal portion of ordinary line.

The Thull Ghaut incline is 6 miles 60 chains, and is estimated to cost for a double line £39,900 per mile, total..... £269,325

Deduct 6m. 60ch. at £7,000 per mile as ordinary line....	47,250
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Extra cost of Thull Ghaut incline	<u>£222,075</u>
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Difference in favour of Thull Ghaut line, as shown above, is miles 130, at £7,000 per mile.....	£910,000
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Deduct extra cost of Ghaut incline.....	<u>222,075</u>
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Difference of cost of construction in favour of Thull

Ghaut line.....	<u>£687,925</u>
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A saving of considerably upwards of half a million of money.

16. It is not possible at present to form anything that may be considered accurate estimates of what may, or may not, be the effect of the adoption of native iron alluded to in Colonel Kennedy's Report. I have assumed £7,000 as the probable cost per mile, which, from experience already gained in the prosecution of railway works, seems to approach the average. For the present calculation, however, the rate per mile is immaterial: whatever it may be, the cost of construction will be in favour of the Thull Ghaut route in the proportion nearly of 26 to 39.

17. But this applies only to the first cost of construction. It is, however, to be remembered, that the selection of the Taptee Valley route, and rejection of that by the Thull Ghaut, would entail on the traffic between Khandeish and Bombay an extra perpetual mileage of 130 miles, that is to say if the traffic passed over the whole line; but there can be little doubt, that on arrival at Surat during the open season of the year, nine-tenths of the goods would be at once transferred to boats, and so brought to Bombay, leaving the line between Bombay and Surat, except for a very small portion of each year, with a very trifling traffic upon it. But of this I shall have to speak more hereafter, in connection with the subject of the main line. This, I must contend, is not what

the merchants of Bombay require. They neither desire their goods to be charged with 130 miles extra mileage, if brought all the way by rail *via* the Taptee Valley and Surat, neither do they wish a break in the transit, such as would be caused by shipping the goods for economy sake at Surat, to come down to Bombay by water, necessitating the intervention of new agency. Their great object has been to obtain a direct unbroken route to the cotton districts of Khandeish and Berar, by which they could manage the transit of the produce of those provinces to their own godowns on the most economical and speedy plan, and also to afford them the opportunity of occasionally visiting these districts in person, and superintending their own operations, instead of trusting to the agency of others; an enterprise, under the present system and means of travelling, presenting so many difficulties, and causing so much loss of time, as to deter most merchants from the attempt.

18. The 2nd point on which I consider the Thull Ghaut line to be preferable is, that it occupies the route already chosen by the traffic of the country. It is only within the last few years that improvements have been made on the Thull Ghaut road; even yet they are not complete. In its former state, the whole road has been truly described as execrable: a cart upon it was unknown; all traffic was conveyed upon pack-bullocks, and in that fashion only with great difficulty; and yet, at the same time, the traffic during the fair season was conducted between Khandeish and Surat by carts. Why, then, it may be asked, did the bulk of the traffic take the then worst road? The answer is, that with all its disadvantages it was the direct one to Bombay, the great mart to which the traders desired to bring their produce. If the railroad were constructed from Surat into Khandeish, whilst the opening of a line *via* the Thull Ghaut was disallowed, there is reason to presume, that from the great facilities offered, the bulk of the traffic would at once seek the Surat route; but surely this is not the fair light in which to view the subject. The way to put the question is—Supposing both lines constructed, by which would the traffic be conveyed? Can any one for a moment doubt but that it would at once seek the shortest road to the principal market? I would here beg to draw particular attention to paragraph 8 of letter No. 1140, of 8th November 1853, from the Resident at Indore to the Chief Secretary to Government, and also to paragraph 13 of the same letter. Sir Robert Hamilton there observes:—

“8. The Valleys of the Taptee and Nerbudda are no doubt productive and valuable, but the course of trade does not follow them, and there is no political necessity for a mile of railroad up or down either; nor does the line of commerce proceed to or from Neemuch to Agra, or either to or from Indore to Agra by the Agra and Bombay road; it, however, presses down from Neemuch to Indore, and from Indore to

Dhoolia, on to Bombay by the Thull Ghaut, in a continuous unbroken stream for eight of the twelve months in each year, and would the year round, but for the want of a road in the rainy season."

"13. The seaward connection between Surat and Bombay has only to be surveyed to be rejected. A 'sweep round the Ghauts' can never be seriously undertaken, unless our engineering skill and science have reached that point which prevents the possibility of talent not being able to devise a plan to render safe the two or three sharp angles in a descent of a distance of seven miles of incline.* The Honorable Court have only to determine that the Ghauts must be surmounted, and the funds which would be expended in constructing the sweep round the Ghauts would be found amply abundant, not only to cover every possible cost, but more than a moiety would be left to carry on the line."

19. However naturally desirous, therefore, the originators of the scheme for the Bombay, Baroda, and Central India Railway may be, to draw the traffic of Khandeish and Berar to Surat by a branch line, I must contend that there is no sound reason for enabling them to do this by a monopoly; that is to say, by granting them permission to construct the Taptee Valley line in supersession of that originally proposed by the Thull Ghaut. That the Thull Ghaut ascent is an unfavourable feature in the direct route is most true; but even supposing its ascent by rail impossible, which is not the case, I am confident, that were the Ghaut ascent by rail omitted altogether, the line constructed to the foot of the Ghaut, and commenced again from the top, leaving the five intermediate miles to be worked by the present excellent road on it, it would still, in every point of view, be a preferable line to the circuitous one proposed. Much stress appears to be laid on the point as to whether the Thull Ghaut line, if sanctioned, is to be considered as a grand trunk line or not, and that although it could not be allowed as such, it might still be sanctioned as a local line. This is what I understand from paragraphs 45 and 46 of the Most Noble the Governor General's Minute. I therefore hope that it may be sanctioned as a local line, leaving it to take its place and character hereafter in the system of Indian railways, according to what its relative advantages may be found to be when railways are further developed.

20. The 3rd point in which I consider the Thull Ghaut route the preferable one is, that mile for mile it is the cheapest to construct. Without going into detailed estimates, for which at present correct data do not exist, I am most confident, having inspected the country throughout on both routes, that the cost per mile of the line *via* Surat and the Taptee Valley would considerably exceed that of the direct line. The very large quantity of bridging required on the section between Bombay and

* Now reduced to five miles and a half.

Surat must alone considerably affect the cost of construction; but in other essential points, whether as regards the nature of the soil and climate, the vicinity of good material throughout the route, and the greater facilities of collecting and keeping together large bodies of workmen, the Thull Ghaut line will, in my opinion, be found to have a considerable advantage. If my views on this point are correct, the estimated cost of construction of the two lines given in paragraph 15, in which the cost per mile was taken at the same rate for both, will show still more in favour of that by the Thull Ghaut.

21. I come now to the 4th point of preference, which is, that, intermediately between Bombay and Julgaum, there are more places and localities on the direct line *viâ* the Thull Ghaut with which it is desirable to open communication than on the other route. By the Surat and Taptee Valley line the only place of any resort that will be touched intermediately is Surat itself, a most important place I admit. There may not be on the Thull Ghaut line any single place of equal mercantile importance, but there are still many localities to which it is desirable to have easy access. To commence with the nearest, I will first mention the table-land at Egutpooree, on the top of the Thull Ghaut. This is attained at a distance of 85 miles from Bombay. The plain is a fertile one, growing large quantities of wheat; the climate is good; and within seven miles of Egutpooree is a mountain (Kulsar), being by repute the highest land in the Deccan. If I understand the commencement of paragraph 20 of Colonel Kennedy's Report, where, speaking of the Deccan, he alludes to "certain enjoyable qualities which its climate can offer," he would seem to deprecate considerations of this sort being allowed any weight; all I would ask, however, is that they should have their due weight and no more. When the condition of such a city as Bombay is considered, with its dense and still increasing population, shut up in a comparatively small island, situated on a low coast, and during the largest portion of the year having a hot and oppressive climate, facilities for travelling, which will enable considerable portions of a society so situated periodically to seek relief from climate, and relaxation from business, is a consideration of very great, though possibly not of primary importance. Here is a sanatorium situated within four or five hours' distance by rail of Bombay, though now but little known: nothing whatever of the sort is to be found on the line *viâ* Surat and the Taptee Valley.

22. Thirty miles from Egutpooree the town of Nassick is reached. This is the head quarters of the Sub-Collector, and in Native (Hindoo) estimation is a place of very great importance. That the Hindoo population of Bombay would highly appreciate and avail themselves of a speedy communication with Nassick by rail all admit, and although the

motive which to a certain extent would induce their resort thither is one in which Europeans may feel no interest, it appears a perfectly legitimate object of railway speculation to supply increased facilities for transit, where a considerable passenger traffic either already exists, or may be reasonably calculated upon when those facilities are provided.

23. From Nassick to the town of Chandore is about 40 miles, and although this latter town has apparently diminished in importance, the line to it crosses the head of the Valley of the Godavery, fertile throughout, producing wheat, gram, and linseed; the two former of importance to the Bombay market for general consumption, the latter yearly rising in importance as an article of export to England. I must here take the opportunity of correcting a small error into which Colonel Kennedy has fallen. In paragraph 24 he alludes to the direct line *viâ* the Thull Ghaut as having also to surmount another, viz. the Chandore range. He has evidently been deceived by the map: there is no Ghaut whatever into Khandeish; the line marked for the rail passes through a broad opening, where the range is entirely broken down.

24. From the vicinity of Chandore, the rail will pass by Munmar, at the entry into Khandeish. Munmar is only 23 miles distant from Malligaum, the military head quarters of the district, and 55 miles from Dhoolia, the civil head quarters.

25. From Munmar to Julgaum is 100 miles, the line passing through the province of Khandeish along the banks of the Girnah, one of the principal tributaries of the Taptee.

26. As I have said before, by the other route Surat would be the only place of importance throughout that would be met with. The interests of the Northern Konkun and Surat, however, will be fully cared for by the direct line to Baroda.

27. I come now to the 5th point, which is, that the Thull Ghaut line would be throughout a paying one. The line follows throughout the course of the very large traffic which now comes from Khandeish and Berar *viâ* the Thull Ghaut to Bombay. This traffic, it has been calculated, is amply sufficient, even at present, to afford a remunerative return: there is no reason, therefore, why each portion of the rail, as it is completed, should not at once prove available for the traffic, and consequently at once remunerative. Possibly, the branch line from Surat to Julgaum would prove equally so; but as regards that portion of 190 miles from Surat to Bombay, I have very considerable doubts. I have already alluded to this subject (paragraph 36 of my former Report No. 17, of the 31st January 1853), and shall again have to speak of it when I come to consider the general project of a northern line.

28. The same reasons which formerly determined the course of the traffic when left entirely to itself to take the direct line *viâ* the Thull

Ghaut to Bombay, in preference to that by the Taptee Valley to Surat, still exist in all their force. No one can for a moment doubt which line the traffic would keep to, were both routes opened by rail, and I therefore must argue that there is no sound reason for now seeking entirely to change its direction, by giving the longer route the advantage of a railway, and not affording the same to the shorter, and in many important points the most eligible one.

29. The 6th and last point that I have to bring forward in favour of the Thull Ghaut line is the healthiness of the district through which it passes. The extreme contrary is the case with reference to a considerable portion of the Taptee Valley line. I alluded to this subject in my former Report; and though I have now placed it last in the list, it is by no means the one of least importance, whether considered relatively to humanity, or the success of a railway project in these districts. I feel confident that no railway company would willingly persist in commencing a scheme if they had reason to believe, that if carried out at all, it must be at a heavy sacrifice of human life; and I am equally confident that Government would not countenance any project of the sort, the more especially when, as in the present instance, the suggested line of railway is only an alternative one. That portion of the country through which the Taptee Valley line passes, extending from Sonaghur *via* Essurwarce to Nundoorbar, or even beyond that a distance of at least 50 miles, is for a very considerable portion of each year of the most unhealthy nature, and cannot, with any safety, be entered after the first fall of rain, until the jungles dry up in the ensuing season, probably from about the middle of June until the middle of February. In the accompanying map, the whole of the portion of country tinted in *Indian ink* may be considered as of this nature.

30. On the arrival of the first portion of the staff of the Bombay, Baroda, and Central India Railway in October last, knowing that it was their intention to prosecute their surveys in this direction, I immediately procured all the information I could from officers acquainted with the districts, which I embodied in a letter (No. 194, of 9th November 1853) to your address, and this letter was forwarded by Government to the officer in charge of the staff for his information. I believe the letter had the desired effect of preventing any of the surveyors' visiting those jungles until February. Colonel Kennedy, from the mode of expression in his concluding paragraph, where, in praising the exertions of his officers, he alludes to their toiling "through those very jungles where death was loudly predicted as their doom," attaches, I fear, but small importance to the common repute of the nature of these districts. I trust, however, it will be remembered, that Colonel Kennedy and his party

did not enter these jungles until, at any rate, the most dangerous portion of the season had elapsed ; that they were but a short time in it, seeing that, according to his own account, the whole Taptee Valley line from Sūrat to Julgaum was reconnoitred in a month, and that the nature of their operations necessitated their observing those very precautions insisted on as the best for all who visit these districts, viz. to keep moving, and never to occupy the same encamping ground longer than can be helped. This is thought necessary even in what, comparatively speaking, is called the healthy season. Colonel Kennedy alludes to all his party coming out of these jungles unscathed : it was but a very few days subsequent to his departure for England that news arrived at the Presidency of the death of Ensign Lamb, one of the young officers alluded to in his 15th paragraph as having accompanied him, and the death of this officer has been attributed, I know not of course with what truth, in the public journals, to the effects of this very expedition. Another gentleman, Mr. Stuart, the Acting Judge in Khandeish, who was in these districts so late as April, expired at Nundoorbar, the circumstances attending his death giving good grounds for believing that the climate had much to do with it. As far as I can ascertain, including Colonel Kennedy and his party, there have been twelve European gentlemen in these districts between the beginning of February and the end of April, and of this number two are dead. One officer, Lieutenant Davidson, of the Engineers, who was there about the same time as myself, the latter end of March last, in writing to me the other day, mentioned casually that his movements necessitated his leaving his servants and establishment for four days continuously at Essurwaree, and the consequence was that every individual, without a single exception, was laid up with fever. I mention these circumstances to show that there are no grounds for hoping that the climate of these districts has in any way improved as respects the character it has borne for a long series of years.

31. Colonel Kennedy, in his 22nd paragraph, quotes Captain Wingate's Report on Khandeish to show how valuable and important a province it is. A further reference to paragraphs 21 to 25 of the same Report would also have given that officer's evidence of the state of all these waste lands in the province : specifying in particular, in section 1st of paragraph 24, the district I am now alluding to, he writes of them as "large continuous tracts of jungle, in the Talookas north of the Taptee towards the Satpoora range, and also in the western Talookas, south of the Taptee, among the hills bordering the Dang, which have a most unhealthy climate, and are either uninhabited, or contain a sparse population, chiefly of Bheels."

In paragraph 22 Captain Wingate writes, alluding generally to all

these waste districts:—"The climate of all these parts is reported to be most unhealthy. The Native inhabitants suffer annually from fever and ague, and from enlarged spleen. To those who are not Natives the climate is still more deleterious, and it would be almost certain death to a European to remain for any considerable time in the jungles between September and February. They become less unhealthy as the hot season advances, but are never quite safe for Europeans, or even for Natives unaccustomed to the climate."

32. Admitted, therefore, as it is on all hands, that these districts are for a considerable portion of the year to be entered only at a great risk, and that, even for the few months during which they are supposed to be comparatively safe, continued residence there is to be avoided, I do not see how railway works are to be prosecuted therein with any reasonable prospect of success. It is not only to the European that these jungles are inimical; Natives of other parts of the country suffer equally from their effects. Even supposing the works to be commenced and prosecuted during the healthy season of each year only, that is for three or four months, still, when they are at last brought to a completion, it is difficult to see how the line is to be worked. A length of 50 miles of railway cannot be left to itself for a single day, like an ordinary road: some resident establishment, if only for inspection and ordinary maintenance, must be kept up; and there are good grounds for believing that few strangers to the district would complete a year's residence. I doubt, however, that the works, if commenced, would ever be brought to completion, as it would be found impossible to keep together the necessary bodies of labourers and superintendents.

33. It has been supposed that a line of railway, if by any means it could be opened through such a district, would have a considerable effect in ameliorating it, not only by the clearance effected by the line itself, but that burning wood in the engines would cause a rapid destruction of the surrounding jungles. A very little consideration will, however, I think, show the fallacy of this. The land occupied by the line itself would be a mere strip. Supposing, for instance, the land so cleared to average throughout 30 yards in width, this would give about 11 acres to the mile: what possible effect could the clearance of such a mere thread have when the dense jungles extend for miles on either side? As to the other point, viz. the possible diminution of the jungles, by their being used up for firing for the engines—the traffic on the line could never be sufficient to cause any perceptible effect on them. In all probability, in such forests the wood would be cut indiscriminately, just as it came most readily to hand, and in that case the annual clearance in such a district would be imperceptible—a tree felled would be replaced in the ensuing season by an undergrowth of bush; a very few acres

only, if set apart specially for the purpose, would be sufficient to supply all the fuel the engines could consume whilst passing through the district. The effect, therefore, of the annual felling, if distributed generally throughout the district, would be unappreciable. Besides, I do not think that the mere felling of the jungle, unless followed by a population, so as at once to occupy and cultivate the cleared lands, would tell to any great degree on the healthiness of the district. The curse which appears more or less to hang over all uncultivated and comparatively depopulated lands appears to attach itself in an especial degree to this part of the country. What is required is population; and my opinion is, that a railroad running through the district would, if anything, tend to keep it in its present miserable state; whilst, on the contrary, a good common road from Surat to Dhoolia, with a branch striking off from Essurwaree to Nundoorbar, and so on to cross the river to Kookurmoondce, would go very far to hasten the influx of inhabitants. A railroad once established, all traffic would pass through such a district—the very facilities for getting through such an inhospitable tract would tend to cause all passenger traffic to be a through one; and with the exception of the few small scattered establishments that must, if such is possible, be kept up for the maintenance of the line, the whole district would be entirely given up to the miserable Bheel tribes at present scattered through it. On the other hand, a good made road would tend to increase the present traffic that is carried on between Khandeish and Surat by carts. Cart traffic necessitates halting-places, where gradually a small population collects, and small clearances and patches of cultivation occur around such posts. This is already the case to a small extent on the existing line of road, and everything that would increase the cart traffic would in like manner tend to increase the population. On the other hand, the running a line of railway through the district, by putting a stop to the occupation of the carts, would at once induce the almost total desertion of the small hamlets now existing.

34. I have dwelt at much length on the consideration of this 6th point, but it is one I know to be of very great importance, and one also in which I feel I should incur a most serious responsibility did I, by failing to urge it in every point of view, lead Government to sanction the commencement of works which I firmly believe would never, under the present state of the country, be carried through to completion. I trust, therefore, that the opinions of strangers to the country, who have merely passed through the district in a flying visit, and that at a season of the year when it is allowed to be comparatively safe to do so, may be received at least with caution, when they are found to be contrary to the opinions of all those whose long experience entitles them to considerable weight.

35. If, therefore, I have now succeeded in showing that the Thull Ghaut line, though nature presents on one portion of it a very formidable obstacle, still possesses several points in its favour, I trust that its selection by Mr. Berkley, the Chief Resident Engineer of the Great Indian Peninsula Railway Company, and my concurrence with him in the propriety of the selection, may not be considered as a grave error, under which term Colonel Kennedy alludes to it in his former Report of 14th September 1852, and again in the present one. The route *viâ* Surat and the Valley of the Taptee, although now brought prominently forward by Colonel Kennedy, is by no means a new suggestion. As far back as the year 1846, when railway matters were first agitated in Bombay, the subject was duly considered. Neither has it been lost sight of since; but the direct route having received the general approval of all parties most interested in railway matters as connected with Bombay, it was adopted by the railway company in preference to the circuitous one, of which the drawbacks were felt to be greater in almost every respect.

36. Having, then, to the best of my ability reviewed all the points connected with the question of the two routes from Bombay to Kandesh, I have now to revert to the main object of the scheme, which, as set forth in paragraph 3, is "to open the most effectual general line of intercourse from Bombay, the great western capital and sea-port of India, through the central and north-western districts, to meet the railway in progress of construction from Calcutta to Delhi."

37. Colonel Kennedy proposes to effect this by a line from Bombay *viâ* Surat, Broach, and Baroda; but, from that point, considers it as still an open question whether the line should proceed *viâ* Godra, Neemeh, Chittore, &c. to Agra, or by a more westerly route by Ahmedabad, Puttun, Deesa, Palee, &c. to Delhi. Considering both routes practicable, he would, on the whole, appear to prefer the latter alternative; and general opinion also seems to be in favour of it.

38. The Report enters into no estimate whatever of the traffic to be expected in these districts, and being myself a stranger to that part of India, I could not presume to offer an opinion on the subject; but can only conclude, that the general state of those provinces affords a reasonable prospect of an amount of traffic sufficient to warrant the establishment of a railway through them. It is evident that another season at least will be required to complete the surveys necessary for the decision on the extension beyond Baroda. In the meanwhile, the question is, whether measures might at once be taken for prosecuting that portion of the scheme extending from Bombay to Baroda, and on to Ahmedabad; for whichever extension is ultimately determined on, the line from Baroda to Ahmedabad would appear to be of great importance, whether

it should hereafter become a portion of the main line to Delhi, or remain only as a branch for the local traffic. This portion of the scheme requires to be considered in two sections, viz. the portion extending from Bombay to Surat, and the portion onward from Surat, through the rich province of Guzerat, to Baroda and Ahmedabad.

39. As regards this latter portion, every opinion that I have heard on the subject admits that it must be an eminently successful project; passing, as the line would, through the richest cotton districts of India.

40. From the perfectly level nature of the country, the earthworks would be of a very light description: the only drawbacks to the line (and they are considerable ones no doubt) are the three extensive river-crossings—that of the Taptee at Surat, the Nerbudda at Broach, and the Mahee between Baroda and Ahmedabad. These river-crossings will be found very serious obstacles; but if they are to be crossed by the rail, and no interruption of a ferry allowed, I fully concur with Colonel Kennedy, that in preference to any masonry structure, an iron superstructure, supported on iron pile piers, will, in all probability, offer the best chance of success for crossing rivers of this nature. The section from Surat to Ahmedabad is about 155 miles in length.

41. As regards the other section, viz. that extending from Bombay to Surat, 190 miles in length, I have already, in my Report No. 17, of 31st January 1853, given my opinion generally, and stated that, considered only in relation to the line *via* the Taptee Valley into Khandeish, it would be a non-remunerative one. After having seen the whole of this country, I must still adhere to my opinion as regards the expense of construction—the large number of river-crossings on the line must very considerably affect the cost. With respect to the other point, as to whether it is likely to prove a remunerative line, I have only to advert to my former opinion, as given in paragraph 36 of the above-mentioned Report; and I am still of the same opinion, that this portion of the line will never be able to compete with the sea route from Surat for the general goods traffic. Cotton, of which the bulk of the traffic would consist, would most certainly during the greatest portion of the year be conveyed by boat to Bombay, unless the railway could undertake its transit at a rate certainly not exceeding $\frac{1}{2}$ d. per ton per mile.

42. But the question of passenger traffic has to be considered. No doubt the facilities of transit would induce a considerable traffic of this description, particularly when the line was completed on to Baroda and Ahmedabad. The whole of Guzerat is very populous; the Natives of that province have large mercantile transactions with Bombay, and, having a particular horror of a sea voyage, however short, would probably eagerly avail themselves of the facilities offered by the railroad. I am quite unable to estimate the possible extent of such traffic; but, to

support a line of 190 miles in length, it must be both considerable and constant.

43. Looking at the subject in a commercial point of view alone, I should consider the most advisable plan would be to commence the work from Surat to Ahmedabad, postponing for the time the section from Surat to Bombay. The original Memorial of the Bombay and Central India Railway Company to the Honorable Court took this view of the subject, and I have some reason to believe that the same opinion still prevails; and that it is only, as the wording of Colonel Kennedy's 58th paragraph would seem to infer, in deference to the suggestion of the Most Noble the Governor General, that it is now proposed to commence the line from Bombay. My opinion of this section is such, that supposing railway companies were engaged in carrying out works in this country uncontrolled by Government, and uninfluenced by the stimulus of guarantees, I believe it would be almost the last portion of line that would be undertaken in this Presidency.

44. I have considered the subject altogether in a commercial point of view, and it is not for me to presume to question further the advisability of proceeding with this section. I would only suggest that such precautions should be taken as would, in the event of this portion not paying its working expenses, prevent the railway company from setting up a claim hereafter to guarantee of dividends instead of interest on capital. A guarantee of dividends is altogether contrary to the views of the Honorable Court, as expressed in their Despatch No. 27, dated 14th November 1849. If the line is sanctioned, without any precaution taken against the expression made use of by Colonel Kennedy in his 58th paragraph, before alluded to, the opportunity might be taken at some future period of advancing such a claim.

45. There is a point connected with this section into which there is no necessity for entering in detail at present. I allude to the alternative line into Bombay *via* Bassein. If this were adopted, and the line brought into Bombay by a separate road, and not over that at present in existence, viz. the Great Indian Peninsula Railway Company's line, the expense that would be incurred in purchasing up the extra land and property required would, I am certain, far exceed the amount that was expended in the first instance for the present line, nearly Rs. 5,00,000. Colonel Kennedy appears to think otherwise; but as far as my acquaintance with the localities and private property that would be affected by an additional line enables me to judge,—and from the offices I have held my experience has now been large,—I must differ from him on this point.

46. Before concluding these observations on the proposals now submitted for the consideration of Government, I am obliged to notice the

sections which accompany the Report as illustrative of it. It may be said that they are merely trial sections. It would not, perhaps, be fair, therefore, to criticise the work with great minuteness; but I am under the necessity of pointing out, with reference to paragraph 37 of the Minute by the Most Noble the Governor General, that neither in the Report itself, nor in the accompanying sections, are there to be found any data upon which even an approximate estimate of the cost of the proposed lines could be framed. The sections, whether considered with reference to their general execution, or the great want of detailed information which is at once apparent on inspection, are in such a state as to be of little real use; and I am obliged to report that they are not sufficient to enable Government to decide on the important questions now submitted for their consideration. I will remark, first, with reference to the sections of the country from Callian to Surat. This is contained in two sheets, No. 1 extending from Callian to Bordoe, 71 miles 66 chains, and No. 2 from Bordoe to Surat, 85 miles.

47. The first portion commences at the formation level of the Great Indian Peninsula Railway Company's line, at a point near Callian. The scale on which it and all the sections are drawn is 4 inches to the mile horizontal, and 100 feet to an inch for vertical dimensions. This last scale is not sufficiently large to admit of an estimate being formed of the quantity of earthwork in cuttings and embankments to obtain certain specified gradients, where, as in the present instance, they have been marked on the section. At 20 miles on this section there appears to be a tunnel of considerably upwards of half a mile in length. Not a word respecting such an important work is to be found in the Report, and there are no notes regarding borings to ascertain the nature of the soil in the tunnel, or any remark as to whether it would admit of being worked by intermediate shafts or side galleries.

48. The datum from which section No. 1 is commenced is duly entered, but nothing is said with respect to No. 2; and whether it carries on the same, or commences on a new datum, it is difficult to say. As near, however, as I can judge from these two sections, the terminus at Surat would appear to be 46·22 feet above the starting point at Callian, which is in all probability not far from the truth. There are several important rivers on these two sections, but so small is the scale, and so slight the allusion to them in the Report, that little is to be gathered respecting their nature. As I crossed them all, and almost precisely at the points I now find selected by the line of railway, I will give a memo from my note-book of what I encountered between Surat and Callian, omitting nullas and water-courses, which were very numerous, and entering only such as really came under the title of rivers:—

Four miles from *Sucheen*, *Madagree* river.—120 yards wide; crossed

at half tide in boats; water 5 feet deep; left bank 40 feet high; deep mud; subject to heavy floods.

One mile from *Kulliawaree*, *Poorna* river.—320 yards wide; crossed at low water; two feet deep; sand and mud; banks not well defined; river subject to heavy floods.

Between *Kulliawaree* and *Gundavee*, *Eeb* river.—200 yards wide; heavy floods in the monsoon.

At *Gundavee*, *Beegumna* river.—30 yards wide; 20 feet deep in the monsoon; mud and gravel.

Between *Gundavee* and *Oondlass*, *Kaverce* river.—100 yards wide; dangerous crossing; detained for half an hour waiting for tide to ebb, then crossed with about 4 feet of water; mud and gravel.

Oondlass, *Kurrara* river.—115 yards wide; banks high and rugged; bed rock, mud, and gravel; not fordable at high tide.

Bulsar, *Oorunga* river.—200 yards wide; deep tidal river; bed rock, mud, and gravel.

Between *Bulsar* and *Paldee*, *Par* river.—255 yards wide; very deep; rough and rocky bed.

One mile from *Paldee*, *Kotul* river.—45 yards wide; deep and rocky.

Between *Paldee* and *Wappae*, *Koluk* river.—166 yards wide; banks 25 feet high; bed rock.

Between *Wappae* and *Sujjun*, *Damungungee* river.—258 yards wide; tidal river; banks high; impassable in monsoon.

Darata river.—66 yards wide; banks 20 feet high; bed rock and mud.

Between *Sujjun* and *Nagunkas*, *Oomugaon* river.—100 yards wide; crossed at low tide; not fordable at high water; bed rock and mud.

Saunta, *Saunta* river.—100 yards wide; fordable at low water; rock and mud.

Between *Mahagaon* and *Kamroolee*, *Soree* river.—66 yards broad; unfordable in monsoon; bed sand and gravel.

One mile from *Kamroolee*, *Wyturna* river.—240 yards wide; crossed at low water; 4 feet deep; sand, gravel, and mud.

Buttana, *Jamsa* river.—150 yards wide; crossed at low water; knee-deep; bed sand and gravel.

Callian, *Kaloo* river.—530 yards wide; tidal river; unfordable; bed rock and sand.

It will thus be seen that there are at least eighteen rivers on the line between Bombay and Surat, of considerable importance, though little of their character is to be gathered from the sections, and as little from the Report.

49. However open to discussion other parts of the project might be, it was never disputed that the line from Bombay to Baroda might be considered as determined, in the event of any scheme in that direction

being carried out; and therefore it seems to me, that in however reconnoitring a style the extensions might have been surveyed, the opportunity of the whole staff being in the country might have been taken to have given in greater detail plans, sections, and approximate estimates of the above portion at least, in order that Government might be able to form some general idea of what they are called upon to sanction. Now it would seem that an entire season has been lost, for this work is still all to be done, and to do it properly would certainly occupy the best portion of the next working season.

50. I now come to the section of the line through the Valley of the Taptee. This is divided into three portions, No. 1 from Surat to Essurwaree, 78 miles 59 feet; No. 2, Essurwaree to Amulnair, 85 miles 15 feet; No. 3, Amulnair to Julgaum, 36 miles. The same remarks, as regards want of detail, attach to this in an equal degree as to that from Callian to Surat. But I have here to remark on a point of much greater importance. As I have before mentioned, the direct line *viâ* the Thull Ghaut, and the circuitous one *viâ* the Taptee Valley, both meet at a common point, viz. Julgaum in Khandeish; and as the latter also commences from a known point on the former near Callian, we have thus an opportunity of testing the one by the other. I have already noted, that by the present surveys, the terminus at Surat is placed at 46·22 feet above that at Callian: by taking the result of the three sections through the Taptee Valley, it will be found that by the first Essurwaree is 25 feet above Surat; by the second Amulnair is 235·93 feet above Essurwaree; and by the third, that Julgaum is 98·4 feet above Amulnair;—that is, that Julgaum is 359·33 feet above Surat, which, with the addition of 46·22 feet, the height of Surat station above Callian, gives the total of 405·55 feet as the height of Julgaum in Khandeish above Callian.

51. Now from the very careful surveys and levellings carried on by the officers of the Great Indian Peninsula Railway Company on the direct route, it is found that Julgaum is just 653 feet above the point at which Colonel Kennedy's line commences. Knowing the officers who have been employed on this work, the time, care, and attention that have been devoted to it, and the numerous checks that have been applied to it, I am quite ready to undertake for its correctness. Colonel Kennedy's section, then, I have no hesitation in saying, gives the result of the height of Julgaum above Callian with an error of no less than 248 feet short of the truth. Where this error has occurred it is impossible to say, but as I think the difference of level between Callian and Surat to be about correct, it will probably have been made in levelling on the Taptee Valley line between Surat and Julgaum. Before detecting this error, I was about to remark on the nature of the gradients as laid down

on these sections, particularly as regards the first division from Callian to Bordee, and the portion of the line between Soneghur and Nundoorbar, and to state, from what I knew of the country, that I felt very certain they would not be obtained in actual practice without works of the most costly description. It is, however, unnecessary for me to enter further on such a point when an error of 248 feet of height appears to have occurred in sectioning a length of only 200 miles of country.

52. The sections of the country between Baroda and Agra are contained in nine sheets of tracings. One of the first points that occurs on examining these, is the occurrence of two tunnels, the one $2\frac{1}{2}$ miles in length, the other 2 miles 25 chains in length. There is no allusion whatever to these important works in the Report. One sheet of these sections is perfectly useless—every vertical measurement throughout the whole sheet has been entirely omitted.

53. Of the sections from Surat to Baroda, and Baroda to Ahmedabad, little need be said—they are across a country nearly perfectly level, and which might almost have been represented by a straight line; but even in these more detail might have been given regarding such very important points as the rivers Taptee and Nerbudda.

54. It is true that the large amount of work represented by these drawings has been performed in less than six months, but I am not aware of any obligation to attempt the execution of so much in so short a space of time; and I am therefore under the necessity of reporting that I consider these documents wanting in many essentials, and that whether the material on which they are drawn is considered,—a very flimsy tracing paper, which will not admit of frequent reference to them being made without the certainty of destroying the records,—or the want of care exhibited in the execution and finishing of the drawings, and the entry of measurements and matters of detail, they are not in the state that documents of such an important nature should be, when submitted for the consideration of Government, more especially when it is considered that it is upon such documents that the prompt decision of Government on matters of the most grave interest is expected.

55. There are two other schemes besides that for a system of railways included in this Report, but I do not consider this to be the place to enter into a discussion regarding them. The first is for the establishment of extensive iron works at Poonassa, with the view of, almost from the first, supplying the requirements of the railway from that source.

There is a most interesting document in Appendix No. III., being a Report by Mr. Jacob, the Geologist of the Railway Company, on this subject. I must, however, decline venturing an opinion as to the probability of these iron works being brought into such complete operation at so early a period as appears to be anticipated.

56. The second scheme is the improvement of the present harbour of Surat, and the possible construction of an artificial one outside the bar. Dredging would, no doubt, improve the present anchorage in the river, but I much fear that nature herself is against Surat ever becoming a harbour, in the full acceptance of the word, for large shipping. The construction even of an artificial harbour outside the bar would never, I imagine, tempt ships of any burden to trust themselves within the Gulf of Cambay after the setting in of the south-west monsoon, for to miss the artificial harbour would entail on them almost certain destruction. The question of the construction of a harbour in such a position is perhaps more a nautical than an engineering one, in the first instance at any rate.

I have the honour to be, &c.

(Signed) J. H. G. CRAWFORD, Captain,
Superintending Engineer, Railway Department.

Bombay, 31st May 1854.

MINUTE BY THE RIGHT HONORABLE THE GOVERNOR,
DATED 18TH JULY 1854.

I have read with the greatest attention and interest Colonel Kennedy's Report upon the Bombay, Baroda, and Central India Railway Company's operations during the last cold season, and the observations upon that Report by Captain Crawford. The question raised in these papers is one of the most important, perhaps, with reference to the material interests of this Presidency—the most important that is likely to come before us or our successors for many years to come. I approach it under a deep sense of responsibility, conscious of my own inability to discuss the professional and technical objections to either the 'Thull Ghaut or the 'Taptce Valley route; but feeling also that this is not a purely professional question, and that it involves other considerations besides engineering ones. Into some of these, indeed, Captain Crawford has very fully entered, and it is necessary that I should follow him over this ground. There are others which he has not touched upon, but which, nevertheless, ought not to be lost sight of, if we would fully and impartially review the whole case.

2. Before entering upon any discussion, however, I think it is as well that I should call the attention of the Board to the primary objects which the Honorable Court and the Government of India have in view in extending their guarantee to railways, and to see how far they are likely to be furthered by the projects before us.

This is the more necessary, as Captain Crawford appears very much to have lost sight of them in the comments he has made upon Colonel Kennedy's Report.

3. In the words of the Governor General's Minute, these objects may be thus defined:—

"1st.—The establishment of a general system of railways, connecting the several Presidencies, and constituting the great trunk lines within them.

"2nd.—The formation of a junction line between Bombay and the grand trunk line from Calcutta to the north-west, either by the Valley of the Nerbudda, or by way of Baroda and Neemuch, but preferably by the latter in the first instance, if further examination should recommend it.

"3rd.—The formation of a line into Khandeish, but not up the Ghauts, unless a survey of the line by the Taptce river should show the Ghaut line to be less objectionable than the river line."

4. I have placed these objects in the order in which they occur in the Governor General's Minute, which has been fully concurred in by the Supreme Council, and by the Honorable Court. I ought to add that the Governor General expressly states, that the Thull Ghaut line should not be sanctioned as a great trunk line of communication between Bombay and the other parts of India; and that even if the Ghaut line into Khandeish should prove better than the river line, it should not be sanctioned as now proposed by the Thull Ghaut, unless further survey should establish that no better access to the table-land can be found on the Sahyadree range, and that the present objectionable features in the Thull Ghaut cannot be avoided.

5. Captain Crawford has confined himself almost exclusively to the consideration of the last of these objects, which is in itself, no doubt, a very important one; and he has, I think, succeeded in making out, that if the principal object in view were to establish a communication by railway between Bombay and Khandeish, the Ghaut line is to be preferred to the valley one. He sums up his reasons (paragraph 12) for preferring the Ghaut to the river line in the following six sentences—as I do not concur in the whole of these reasons, I propose to offer my remarks upon them *seriatim*:—

“1st.—The Thull Ghaut line is to be preferred to that by Surat and the Taptee Valley, in that it is the most direct.

“2nd.—That it occupies the route by which the traffic of the country is at present conducted.

“3rd.—That, omitting the Ghaut ascent as an exceptional case, it is mile for mile a cheaper line to construct.

“4th.—That, intermediately between Bombay and Julgaum, there are more places and localities on the Thull Ghaut line with which it is desirable to open communication than on the other route.

“5th.—That there is every reason to expect that it will be throughout a paying line.

“6th.—That it passes through a healthy country.”

6. I have just said, that if the principal object in view were to establish a communication by railway between Bombay

1st Reason.—“The Thull Ghaut line is to be preferred to that by Surat and the Taptee Valley, in that it is the most direct.”

and Khandeish, this line would be entitled to the preference. But this is not the question: what we have to consider is—Which line is the best for the general interests of this Presidency, and of British India? It has been decided by the highest autho-

rities that the Thull Ghaut line ought not to be sanctioned as a grand trunk line between Bombay and the other parts of India: consequently,

its formation would not further the two first objects laid down in the Governor General's Minute.

7. The Taptee Valley line would give a circuitous communication between Bombay and Khandeish, but it would give us a railway communication with Guzerat, the richest province under this Presidency, and the one from which we derive the bulk of our exports; it would give us the preferable line of railway to the North-West Provinces; and it would promote the eventual extension of railways to Scinde and the Punjaub. It would give even Khandeish and Berar a shorter and more level route to the sea, should it be found to be worth while to ship the cotton of those provinces at Surat, instead of bringing it on by railway to Bombay.

8. Captain Crawford urges strongly the disadvantage of a break in the transit, such as would be caused by shipping the goods for economy sake at Surat, to come down to Bombay by water, thereby necessitating the intervention of new agency. I do not deny the inconvenience of transshipment, but I do not perceive the necessity for incurring it. If the facilities for shipping goods at Surat can be increased so as to lead to the cotton, &c. brought by the railway being shipped there as Colonel Kennedy anticipates (Report, paragraph 55), there is no reason, I suppose, why they should not be sent off at once to any part of the world in the same vessels. On the other hand, if it is found more convenient to ship them at Bombay, they will be carried on by the railroad, at an additional cost, as Colonel Kennedy states, of from 8*d.* to 16*d.* per ton.

9. But admitting that, for the sake of saving some portion of this additional expense, the inconvenience of reshipment will be sometimes submitted to, I must observe that Captain Crawford's sense of this kind of inconvenience appears to be much keener upon this line than on the other; for in a subsequent paragraph (19) he says:—"That the Thull Ghaut ascent is an unfavourable feature in the direct route is most true; but even supposing the ascent by rail impossible, which is not the case, I am confident, that were the Ghaut ascent by rail omitted altogether, the line constructed to the foot of the Ghaut, and commenced again from the top, leaving the five intermediate miles to be worked by the present excellent road on it, it would still in every point of view be a preferable one to the circuitous one proposed."

10. I should be disposed to question the soundness of the 2*nd* reason, even if I admitted the grounds upon which it rests;

2*nd* Reason.—"That it occupies the route by which the traffic of the country is at present conducted."

for commerce always takes the easiest route which is open to it. Before Vasco de Gama, the commerce of India, such as it was, found its way to Europe by the Red Sea, and at an earlier period,

when that route was closed, by Samarkand and Bokhara; but the moment an easier (though by the way a more circuitous) route was open to it, it forsook its former course. And so with the cotton of Berar: thirty years ago, not a bale of cotton was brought from these districts to Bombay; its only outlet then was by the Ganges. "In 1824-25, an attempt was first made by wealthy Native merchants to establish a traffic in cotton between Berar and Bombay. Sir Jamsetjee Jejeebhoy took the lead, and was quickly followed by Karna Sunker Gopaljee, Runmul Sunker, Viccajee and Pestonjee Meerjee."* The route at first was probably by the Malsej Ghaut, which had been made or restored by Nana Furnavees. The Bhore Ghaut road was not opened till 1831. It is only within the last few years that the Thull Ghaut has been improved, at an expense of lakhs of rupees, and it is now the main channel of communication between Berar and Bombay. But if superior facilities were afforded by any other route, I have no doubt that it would in its turn be as readily and as quickly abandoned as the routes which it superseded.

11. I cannot, however, admit what is implied in this reason of Captain Crawford's, viz. that there is now no traffic, or very little, along the Taptee Valley to Surat. There is a very great amount of traffic between Guzerat and the Deccan, which must adopt the line of the Taptee Valley, and which is wholly independent of any line to Bombay. There are no recorded statistics of the amount of this traffic, but I am assured upon most excellent authority that it is very great; and there is no doubt that it would be largely increased by any improvement of the facilities for transit on the Taptee Valley line.

12. The 3rd reason, like the 1st, would have greater force if the main object were to connect Bombay and Khandeish; but against the saving of upwards of half a million, which Captain Crawford thinks will be effected by the adoption of the Thull Ghaut line, must be set the loss of a railway communication between Bombay and Guzerat, according to Captain Crawford himself (paragraph 39) the richest cotton district of India, to say nothing in this place of the eventual prospect of effecting what the Government of India consider the preferable junction with the Upper Provinces and Central India. Besides, I must remark that the argument is incapable of proof, without detailed estimates, and that these do not at present exist. The very heavy expense which has attended the construction of a common road from Shahpoor to the foot of the Thull Ghaut shows, I think, that it ought not to be admitted without question.

3rd Reason.—"That, omitting the Ghaut ascent as an exceptional case, it is mil^l for mile the cheaper line to construct."

* Chapman's Cotton and Commerce of India, page 75.

13. It does not appear to me that there is greater weight in Captain Crawford's 4th reason than in the preceding ones.

4th Reason.—"That, intermediately between Bombay and Julgaum, there are more places and localities on the Thull Ghaut line with which it is desirable to open communication than on the other route."

Without taking into account the many populous cities and rich districts which the prolongation of Colonel Kennedy's line would connect with Bombay, and confining our view to the places on either line between Bombay and Julgaum, I am prepared to show that there are more places, with a certain amount of population and commerce, and a greater variety of exportable produce, upon the Surat than upon the Thull Ghaut line.

14. Captain Crawford himself admits that Surat is a place of greater commercial importance than any upon the Ghaut line.

15. Besides Surat, the 'Taptee Valley passes through Danoo, Balda Paree, Bulsar, Gundavee, Nowsaree, Soneghur, Nundoorbar, Amulnair, Dhurrungaum, and Nusseerabad, and at a short distance from Basscin, Mahim, Cheechun, Damaun, Soneghur, Erundole, besides a number of considerable places on the north bank of the 'Taptee.

16. After leaving Callian, the Thull Ghaut line passes through no place which is marked in the map as more than a mere village.

17. Munmar, the only place quoted by Captain Crawford which lies actually on the line, as marked upon the map which accompanies his Report, is of this class. The other places alluded to by Captain Crawford, viz. Nassick, Chandore, and Malligaum, are from 10 to 20 miles distant from the line, and Sunnur and Burgaum, which he has not mentioned, appear to be about equally distant from it.

18. To assist in forming an estimate of the comparative importance of the places on or near the two lines, I transcribe below such information as I have been able to procure from a reference to the records of Government, and from other sources:—

PLACES ON THE TAPTEE VALLEY LINE.

Danoo.—512 houses; 2,310 inhabitants. Trade (including Cheechun)—

Imports..... Co.'s Rs. 90,267

Exports..... 3,08,300

Balda Paree.—3,504 inhabitants. Trade in rice, timber, salt, and grain. A Mamlutdar has recently been appointed to reside in this place.

Bulsar (an increasing population), 9,765 inhabitants in 1851.

Imports & Exports (same year)..... Rs. 10,24,362

Ditto in 1852-53..... 11,24,020

Gundavee.—9,000 inhabitants, chiefly Parsees (in 1850). Exports

ginger and castor oil, *gram*, timber, and all kinds of jungle products for making dyes, medicines, &c. ; cotton and silk cloths manufactured.

Newsaree.—15,800 inhabitants, many Parsees. The country around Newsaree is particularly rich and productive. The trade of this place is chiefly in agricultural products. This town and Gundavce belong to the Guicowar, who used to receive Rs. 120 per beega for the sugar-cane land at Gundavce.

Surat.—Population 89,505 (census of 1851). Trade in 1852-53, from official returns—

Imports.....	Rs. 33,27,714
Exports.....	33,96,689
	<hr/>
	Rs. 67,24,403

Songhur.—About 2,000 houses

Nowapoor.—No information.

Nundoorbar.—1,962 houses (1851); population 6,863.

Amulnair.—1,661 houses; population 6,955.

Dhurrungaum.—6,360 houses; population 8,968.

Nusseerabad.—No information.

PLACES NEAR THE TAPTEE VALLEY LINE.

Bassein, with suburbs.—Population 18,980 in 1852-53.

Imports.....	Rs. 3,50,851
Exports.....	8,11,093
	<hr/>
	Rs. 11,64,944

Exports chiefly salt and sugar.

Mahim.—Population 5,357. Exports and Imports in 1852-53, Rs. 2,54,496.

There is no statistical information that I have been able to find respecting *Damaun*. Mr. Reid, Assistant Collector of Surat, estimated the population at 10,000.

PLACE ON THE THULL GHAUT LINE, MENTIONED BY CAPTAIN CRAWFORD.

Munmar.—125 houses, 500 inhabitants.

PLACES NEAR THE THULL GHAUT LINE.

Nassick.—About 10 miles from the line; 30 from Egutpooree, at the top of the Ghaut; 3,687 houses; 21,860 inhabitants. No trade returns procurable.

Chandore.—About 20 miles from the line: 1,277 houses; 5,558 inhabitants.

Malligaum.—About 20 miles from the line; a military station : 1,400 houses; 7,481 inhabitants.

Sunnur.—10 miles or so from the line; 1,368 houses; 7,497 population.

Burgaum.—About the same distance : 955 houses; 3,508 population.

19. I must not omit to notice a consideration to which Captain Crawford adverts in connection with the ground of preference with which we are now dealing. The Thull Ghaut route would give an easy access to a sanatorium situated within four or five hours' distance by rail of Bombay, though now but little known. This sanatorium is either the table-land at Egutpooree, at the top of the Thull Ghaut, or it is a mountain (Kulsac), reputed to be the highest land in the Deccan, within 7 miles of Egutpooree. The former would possess no advantage that I am aware of over Matheran, which will be brought certainly within four hours of Bombay at the end of the present year, or whenever the line towards Poona is completed to Narell, or over Khandalla or Kusoor, whichever point may be chosen for ascending the Ghauts in this (south-easterly) direction. The latter (Kulsae or Kulsabae) I have made inquiries about, and if this is the spot where Captain Crawford expects to see a sanatorium established, I fear the result shows that the expectation is not likely to be realized. Dr. Gibson thus writes of it in a private letter to a friend :—"I did not require to ascend Kulsabae again, as I had seen all that could be seen, which by the way is not much. The hill is 5,200 feet high, ascent long, but easy; no jungle, and the top a mere plate of rock; length within a quarter of a mile, with a small mount, on which there is a temple. The supply of water is from one spring, and would not, I should think, suffice for twenty persons."

20. When the guarantee of Government is asked to one of the two lines, it is not enough to assert, or even to prove that one of them is likely to be a paying line. The converse must be proved of the other, or it is no argument in favour of the first. Admitting, however, for the sake of argument, that Captain Crawford's estimate of the cost of both lines, and of the remunerative prospects of the shorter line, is correct, it still remains to be considered whether the guarantee of Government should be given to this line, which only opens up that part of the country to which it directly leads, and which, in the deliberate judgment of the Government of India, should never be sanctioned as a great trunk line of communication, or to the longer line, which not only affords to the same districts an easier and shorter road to the sea, but which unites to the capital of this Presidency some of its richest and most important districts, and which may eventually place us in direct railway communication with Delhi, Scinde, and the Punjab.

5th Reason.—"That there is every reason to expect that it will be throughout a paying line."

21. I now approach the last of the reasons which Captain Crawford assigns for his preference of the 'Thull Ghaut route.

6th Reason.—“That it passes through a healthy country.”

I do so with a due sense of the importance of the considerations which it suggests. Though I cannot admit of Captain Crawford's assertions without qualification, yet I will not for a moment deny that the tract of thinly inhabited and woody country at the foot of the 'Thull Ghaut is both less extensive and less unhealthy than that which would be traversed by the Taptee Valley line.

22. It may be as well, however, to show that the Thull Ghaut is not altogether as healthy or as cheaply to be constructed a line as it is sometimes represented. In Mr. Chapman's excellent work on the cotton and commerce of India, I find (in Appendix, page 386) an extract from a letter from the late Mr. Langford, Collector of Ahmednuggur, on the subject of the 'Thull Ghaut Line:—"I doubt much, however, if you could have found a line for a rail from Shahpoor to Kussara, as in parts the country is very rugged, having many deep ravines, that would have been great obstacles to the works; added to which, this line is, at certain seasons, a particularly unhealthy one, and Kussara, which you must have made a halting station, about as deadly a place as any I am acquainted with, the fevers caught there generally being fatal ones." Again, at page 388 of the same book, I find the following opinion of the late Lieutenant Chapman, who was then employed in making the admirably engineered road up the 'Thull Ghaut, which has since been called by his name. After stating that the villages in the neighbourhood are few and small, and that it is difficult to obtain a sufficient number of hands, he proceeds:—"During the hot season the scanty supply of water deters workmen from assembling in numbers; during the rains the greater portion are engaged in cultivating their village fields, which occupation an offer of employment, remunerating in a quadruple degree would, I hardly think, induce them to forego; and during the cold season the climate of the Ghaut jungles is of so deadly a nature, especially to a Deccanee man, that few are found willing to stand the brunt of it." The authority upon which the above statements rest will not be disputed, neither can it be denied that they, to a certain extent at least, impugn the reason for preferring the 'Thull Ghaut line, which we are now considering.

23. The Taptee Valley line, however, would pass for some 50 miles through the Dang jungles, a tract which Captain Crawford considers so deadly, that he doubts it would be possible to complete the road through it, from the difficulty which would be found in keeping bodies of coolies together in it (paragraph 32). If this doubt be well founded, the question of making the line must be decided in the negative; but

until it has been tried, I should be slow to admit the impossibility ; indeed, as far as making a common road can be considered a test, it has been already solved, and the possibility established.

24. If it be possible to construct a railroad through an unhealthy district, it is clear that in a sanitary point of view, as well as in every other respect, it would be a more eligible means of transit than an ordinary road.

25. Captain Crawford contends (paragraph 33), I think somewhat paradoxically, that making a railroad through the Dang would not only prove of no use in assisting the clearance and improvement of the district, but that it would tend to keep it permanently in its present wretched condition. To prove this, Captain Crawford argues that the clearance would be confined to the mere strip required for the line itself, which he averages at 11 acres per mile, and to the cutting of wood for fuel for the engines, which would produce no perceptible effect upon such immense jungles, as a tree felled would be replaced in the ensuing season by an undergrowth of bush.

26. I venture to think that the clearance, if the railroad were made, would be much greater than Captain Crawford supposes. In the first place, the railroad itself does not merely consume wood as fuel for the engines : sleepers are required for the permanent way, and timber for building and fencing purposes. It might, perhaps, be cheaper in the first instance to burn wood in the furnaces for smelting iron, than to extend the line some 70 or 80 miles beyond them to the coal-field of the Nerbudda ; and the wood required for these purposes would be but a small portion of what we may reasonably expect would be felled in consequence of the opening of the railway. I am informed by Dr. Gibson, the Conservator of Forests, that the timber now sold from the Dang jungles amounts to from Rs. 35,000 to Rs. 60,000 per annum, according to the demand for it, and that the price is very much enhanced by the rugged nature of the roads.

27. There can be no doubt that this is the case ; and that if facilities were afforded for transporting this valuable timber to a market, its price would be reduced, and the demand for it proportionably increased. If a railroad were carried through these forests, there would be a timber yard at every station, and an increased supply would be opened to the ship-builders of Surat and Bombay. As this supply became exhausted in the neighbourhood of the railway, branch lines would be laid down in the more distant parts of the jungle, and as great clearances would be thus in time effected, with a little encouragement—a remission of assessment for a certain period, &c.—the land thus cleared would be occupied or cultivated. The theory that a tedious and expensive cart traffic has a tendency to improve and develop the resources of an unhealthy district, while a more rapid and economical mode of transport

would lead to an opposite result, has certainly the merit of originality. I may be pardoned, however, for expressing my conviction that the progress of clearing and improvement in any district will be in the ratio of the facilities afforded for traversing it, and for exporting its produce; that produce being, in the present case, precisely of the description which a railway would convey most easily and cheaply to market. I cannot quit the subject of the unhealthiness of this part of the Taptee Valley line without noticing the two fatal instances which Captain Crawford quotes in corroboration of his views. Mr. Stuart certainly died at Nundoorbar, and had exposed himself to the effects of the climate of the Dang; but he did not die of fever, but of cholera, which was at the time very prevalent all over the country.

28. I have Dr. McLennan's authority for stating, that from the accounts transmitted to the Medical Board, Ensign Lamb's death was attributable to the effects of exposure to the sun, quite irrespective of malaria. But, in truth, as I understand that he began his survey at Amulnair, and worked towards Julgaum and the eastward, his lamented death could not in any case be ascribed to the peculiar unhealthiness of the country. He never was within 50 miles of the Dang.

29. If I chose to quote isolated cases in support of Mr. Langford's and Lieutenant Chapman's opinions on the subject of the unhealthiness of the Thull Ghaut line, I might refer to a recent communication from Dr. Green (No. 666, paragraph 3), who has been erecting the electric telegraph upon the exact line which Captain Crawford says passes through a healthy country.

30. He informs us, that from deaths and disease he is left without an inspector. I should be sorry, however, to argue from this that the electric telegraph ought not to have been erected, or that it should have been carried by a different route.

31. I fear that whichever way the railroad is made, we must be prepared for very numerous casualties. Every possible means must be taken to lessen the risk, and to reduce the number of victims; but it would be as idle to expect that we shall carry on a victorious campaign on the Danube without loss, as that we should successfully overcome the physical difficulties with which we have to contend in making railroads through such a country as India, without a certain and heavy sacrifice of human life.

32. I have now gone through the reasons assigned by Captain Crawford for preferring the Thull Ghaut to the Taptee Valley line into Khandeish; but before I turn to his observations on the main line of the proposed Bombay, Baroda, and Central India Railway, I must point out that the difference of length between the two lines into Khandeish

will be reduced by 16 miles if the line by Mahim and Ghorebunder, which seems preferable in every respect to the other, is selected.

33. I may further remark, that if it be admitted that the formation of the main line is desirable, which will hardly be contested by any one who has read the Governor General's Minute, and is capable of giving an impartial consideration to the subject, the advantage of a branch line, to enable the Company that undertakes this important line to bring down the iron of the Valley of the Nerbudda for its rails, and the timber of the jungles of the Taptee for its sleepers, is almost equally apparent. Nor will this advantage be confined to this Company alone. I shall presently allude to other projects, which would be greatly furthered by a reduction in the price of these materials—a saving, according to Colonel Kennedy's calculation, equal to at least three-sevenths of the cost of construction.

34. I now come to Captain Crawford's observations on Colonel Kennedy's main line, which is intended ultimately to connect Bombay, the great western sea-port, with the Central and North-Western Provinces of India. The direction of the line, however, is at present determined only as far as Baroda—the extension to Ahmedabad may either form a portion of the main line or a branch: this will depend upon the result of a further examination of the different routes by which it is proposed to effect a junction with the grand trunk line from Calcutta to the west.

35. I must admit, that while I can have no difficulty in arriving at the conclusion that this line would be an eligible one as a great trunk railway, it is hardly, perhaps, to be expected that Captain Crawford (paragraph 38) should give a professional opinion upon the very slight data which Colonel Kennedy's present Report affords; but while I do not blame him for suspending his judgment upon a portion of the project which is so far from being matured, I must say that I think it would have been as well if he had also postponed all remarks upon the details of this portion (paragraph 52) until its general features had assumed a more definite shape.

36. The direction of the line, however, to Baroda, with the extension to Ahmedabad, whether the latter is to become a part of the main line, or only a branch, is fixed; and Captain Crawford divides it into two sections, for the purpose of considering each separately.

37. The first of these sections, from Bombay to Surat, he thinks (paragraph 43) is not likely to pay: "My opinion of this section is such, that supposing railway companies were engaged in carrying out works in this country uncontrolled by Government, and without the stimulus of guarantees, I believe it would be almost the last portion of line that would be undertaken in this Presidency."

38. The principal reason for this opinion seems to be that a railway

cannot compete with the sea route for the general goods traffic. Captain Crawford acknowledges (paragraph 42) that the passenger traffic is likely to be considerable, "particularly when the line is completed on to Baroda and Ahmedabad. The whole of Guzerat is very populous; the Natives of that province have large mercantile transactions with Bombay, and, having a particular horror of a sea voyage, however short, would probably eagerly avail themselves of the facilities afforded by the railroad." He is, however, quite unable to estimate the possible extent of such traffic; "but, to support a line of 190 miles in length, it must be both considerable and constant."

39. I must, in the first place, doubt whether, as assumed by Captain Crawford, the sea route will always be preferred to the railroad for the general goods traffic.

40. It must be borne in mind, that with Native sea-going craft, the advantage of such means of transport depends very much on the direction in which the goods are going.

41. While the prevailing winds are northerly, the voyage from Surat to Bombay is short and certain, that from Bombay to Surat long and tedious; and *vice versa* when the winds become southerly.

42. During the prevalence of northerly winds, the railway will offer great advantages for the transport of goods going to Surat; after the southerly winds set in, equally great advantages for goods coming from Surat. During the monsoon, indeed, the railway would have the advantage either way.

43. With respect to the passenger traffic, I need only refer to the passage I have just quoted from Captain Crawford's Minute, and to my remarks and marginal notes in paragraph 18 of this Minute, in which I compare the trade and population of places on this section of the line with the Thull Ghaut line.

44. I now come to the section between Surat and Ahmedabad. Upon this portion of the line, I need only quote Captain Crawford (paragraph 39):—"Every opinion that I have heard upon the subject admits that it must be an eminently successful project, passing, as the line would, through the richest cotton districts of India."

45. A little further on he says:—"Looking at the subject in a commercial point of view alone, I should consider the most advisable plan would be to commence the work from Surat to Ahmedabad, postponing for the time the section from Surat to Bombay."

46. There appears to me to be some little inconsistency in Captain Crawford's opinion, that in a commercial point of view, the railway from Guzerat should stop at Surat, while that from Khandeish should be carried (*via* the Thull Ghaut) to Bombay. Surat is the nearest shipping port to both these provinces, and if it is, or can be rendered a

sufficiently good port for Guzerat, why should it not be worth connecting by railway with Khandeish?

47. I have myself no doubt of the great advantage, in a commercial point of view alone, of connecting Bombay by railway with its most fertile province; and, looking upon the project in this narrower light, I am not disposed to consider the two sections into which Captain Crawford has divided this part of the line independently of each other, but, as a Government, we are bound not to confine ourselves solely to mercantile considerations.

48. Bearing in mind the great political and military objects contemplated by the Governor General, as explained in the 30th to the 35th paragraphs of His Lordship's Minute of 20th April 1853, I cannot doubt that the Baroda line ought to be sanctioned.

49. I may here advert to the project of a Scinde and Guzerat railway, which was shown me by the late Mr. Stuart a short time before his death. This line would branch off from the Baroda and Ahmedabad line at Neriad, and, passing by Kaira and Dholka, with a branch to Bhownuggur and Gogo, and another to Rhadunpoor, it would traverse Kutch, and come out upon the Indus at Jerruck, from which point to Kurrachee I understand that another company propose to construct a railway.

50. I am perfectly aware, that at the commencement of a great European war there can be but a remote prospect of the execution of such extensive projects; and I fear that this difficulty may affect the lines now in progress, as well as those which we are now considering; but they are not, on that account, to be kept out of view altogether. The policy of completing a great system of railroads, uniting every part of India, is constantly to be kept in sight; and in considering a proposal like the one now before us, the prospect, however distant, of establishing a railway communication between Bombay and Scinde, and of thoroughly opening up the rich cotton field of Guzerat, ought not to be disregarded.

51. In connection with this proposal, Colonel Kennedy has made a suggestion for the improvement of the common roads of Guzerat, which appears to me well worthy of being tried. I allude to the plan detailed in paragraph 54 of his Minute. I would furnish a copy of this paragraph to the Collector and Executive Engineers in Guzerat, and request them to give it a trial upon roads of different classes, and report the result for the information of Government.

52. I will not enter in this Minute upon the consideration of the plans in Colonel Kennedy's Report for the improvement of the harbour of Surat, and the protection of the town from floods. These are most important and interesting subjects, but it is not necessary to mix them

up with the discussion on the merits of the line of railway now before us.

53. Neither will I follow Captain Crawford in his criticism upon professional details, upon which, with the exception, perhaps, of the flimsy texture of the tracing paper upon which the plans are drawn, and which tore in my hands from a gust of wind, I am not competent to offer an opinion. I may, however, be allowed to notice one point, upon which an explanation has suggested itself to me, which has escaped Captain Crawford. This is an error which has been made in the levels. Colonel Kennedy's surveys make the point at which both railways meet, at Julgaum in Khandeish, only 405·55 feet above the starting point at Callian, whereas, according to the more accurate and careful survey of the Great Indian Peninsula Company, it is 653 feet above that place. Captain Crawford believes that the error must have occurred between Surat and Julgaum, as he thinks the difference between Callian and Surat (46·22 feet) is about correct.

54. Now, the section in which Captain Crawford believes the error to have taken place is precisely the Taptee Valley section, upon which Colonel Kennedy, having only one surveyor available, was glad to obtain the assistance of three young officers of the line, who got leave to assist him. It is hardly fair to impute this error to Colonel Kennedy's staff, when it is evident that it is more likely to have been the fault of these volunteers.

55. It must not be inferred from anything that I have written, that I undervalue the importance of Captain Crawford's professional criticism. I fully admit the necessity of the most rigid scientific and practical scrutiny in all projects of this nature, and, differing as I do from Captain Crawford upon the general question, I am also aware that the solution of that question must, in a great degree, depend upon professional points, which I feel myself incompetent to discuss.

56. In concluding this Minute, I trust it is unnecessary for me to disclaim either partiality towards Colonel Kennedy's scheme, or an opposite feeling towards the Great Indian Peninsula Company's. I have endeavoured to consider fairly the claims of the former to the support of Government, with reference to those objects which the Government of India has declared to be of primary and paramount importance; and I am bound to say, that in my humble opinion, and as far as I am able to judge, it appears to meet those objects. The Thull Ghaut line would not do so.

57. The Government of India, indeed, have decided, that it is not fitted for a great trunk line, and that even if it is preferred to the branch by the Taptee Valley as a local line, it is not to be sanctioned until a searching survey shall have established the fact that no better access to

the table-land can be found, and that the present objectionable features in this Ghaut cannot be avoided. I understand, that in the course of the last working season, some improvement has been made in the incline upon the Thull Ghaut. The Report is not yet before us, and I have not heard that any such general examination of the Sahyadree range has yet been made as will satisfy the Government of India that the present is the best line that can be found for ascending the Ghauts.

58. The effect, therefore, of adopting Captain Crawford's opinion would be, not merely to express our preference for a line whose prolongation will not be sanctioned as a great trunk line, but to postpone for an indefinite period the establishment of railway communication with Guzerat, Scinde, and Hindustan, and even with Khandeish and Berar.

(Signed) ELPHINSTONE.

18th July 1854.

MINUTE BY THE HONORABLE MR. WARDEN, DATED
29TH JULY 1854.

As the Right Honorable the President treats the subject of railways in India with a skilful hand, betokening that he has studied the subject, it is the less necessary that I should trouble the Board with any detailed remarks: still I am unwilling to record a silent vote on what His Lordship justly esteems a question the most important that is likely to come before us or our successors for many years to come.

2. Colonel Kennedy and Major Crawford do not, as it appears to me, join issue on the same point. The Colonel places his recommendations (and they are the recommendations which he supported when, as yet, he had no personal interest in the matter) on the broad basis on which alone such railways as are to be "executed without further delay" can be sanctioned (Governor General's Minute, paragraph 9), viz. "upon a scale proportioned to the extent of the British dominions in the east, and to the immediate benefits they are calculated to produce: the main considerations being the extent of political and commercial advantages which a railway is calculated to afford; the engineering facilities which it presents; and its adaptation to serve as a main channel for the reception of such subordinate lines as may hereafter be found necessary for special public purposes (G. G. M. para. 15), or for affording the means of conveyance to particular districts"; it being "of the first importance

to connect the several Presidencies by a line of rail, each with the other (G. G. M. para. 28), and to unite Hindustan and the districts to the north-west with the western parts of the peninsula"; it being expected of the railways to be executed without delay, that "the Presidency of Bombay shall, from its political situation, afford, with safety to itself, extensive and valuable aid to the Government of India, in the event of the Bengal army being suddenly and heavily threatened by any of those very possible events, viz. an invasion by the way of Cabool, and by an European force, or trouble on the frontier of Nepal." (G. G. M. paras. 20, 21.)

3. While these are the objects embraced by Colonel Kennedy's proposals, Major Crawford gives precedence to the question of the communication with Khandeish (letter of 31st May 1854, paragraph 9), in order that a decision as to the route, viz. the Thull Ghaut or Taptec Valley, may be come to *with as little delay as possible*; and in the 2nd paragraph of his letter dated the 31st January 1853, he says that he proposes, after some slight allusion to the questions of vast and extended importance embraced by Colonel Kennedy, to "confine himself to the portion of Major Kennedy's Memoir more particularly affecting the question of railways on the Bombay side of India;" but while we are on the one hand forbidden (G. G. M. para. 47) to sanction the Thull Ghaut even as a local line, until further examination shall have been made, and an authoritative comparison instituted between the Ghaut line and the river line, and told (G. G. M. para. 43) that the Thull Ghaut line ought by no means to be adopted as a great trunk line, unless nature has denied the possibility of finding a better; we are, on the other hand, enjoined, in dealing with so large a matter as railways for India, to look beyond the interests and the impressions of the moment." (G. G. M. para. 53.)

4. Even then, if we had before us all the information on which the "authoritative comparison" between the Ghaut line and the river line could be made, we could not follow either "without delay," unless it can be at the same time shown that such line is fit to be a trunk line.

5. But we shall not have reached this point until we have surveyed the Ghauts from end to end, and ascertained the comparative virulence and extent of the fever prevailing at Kussara, and other localities of stagnant air immediately under the Ghauts, and that which prevails in the 50 miles of jungle between Surat and Khandeish. Judging, however, from the tales I have heard, from time to time, during a service of more than thirty-three years, of the victims to the latter, the mortality to be expected from opening the river line will be comparable to the risk of a forlorn hope rather than to that of ordinary campaigning, and the result such as Walcheren exhibited rather than anything that will, as I hope, befall us on the Danube.

6. On this matter Major Morris, the Superintendent of Police in Khandeish, who has passed many years in the neighbourhood of those jungles, might, I think, be consulted with advantage.

7. As we are not, then, in the condition required by the Governor General for making our election between the Ghaut and Taptee lines, and even if we were, we are bound to address ourselves, in the first instance, to the trunk lines, which are to be entered on "without delay," for the reasons urged by His Lordship the President, from the 12th paragraph of his Minute, and never doubting that whichever route we take, the "line will readily draw the traffic to itself," I cannot hesitate to express my concurrence in the opinion conveyed in his 48th paragraph, that the Baroda line ought to be sanctioned.

(Signed) J. WARDEN.

July 29th, 1854.

MINUTE BY THE HONORABLE MR. LUMSDEN, DATED
2ND SEPTEMBER 1854.

After having attentively read and considered the Minute of our Right Honorable President, I submit the following remarks with the utmost deference, and with considerable hesitation.

2. Indeed, it is solely a sense of responsibility which impels me to add a word to what he has written, and the hope that a brief discussion of the subject from a somewhat different point of view, however wanting in authority, may yet prove of some slight assistance to those with whom the settlement of the question now at issue will finally rest.

3. I will consider that question as confined to very narrow limits—Is the railroad which is to unite Bombay with the cotton producing districts of Khandeish and Berar to be carried over the Ghauts, along the line surveyed by Mr Berkley and his staff, for the Great Indian Peninsula Railway Company, or by the line projected by Colonel Kennedy, along the coast to Surat, and thence eastward by the Valley of the Taptee to the village of Julgaum, in Khandeish, where it would meet the former line, and from whence either line would take a common direction eastward towards Berar?

4. It seems to be understood by our Right Honorable President, that the adoption of either line would necessitate the relinquishment of the other.

5. It is because I am unable to view the matter in that light that I venture to offer a few observations, to which I attach no other value than that they express convictions which in my place I feel I ought not to conceal.

6. If, indeed, it should be resolved that only a single line of rail, leading from Bombay into the interior, in a northern and north-eastern direction, is to be sanctioned, then I should unhesitatingly subscribe to the opinions of our President.

7. It only becomes me to say that I think he has taken the statesman-like view of the question, and going over his Minute paragraph by paragraph, if only a single line is to be permitted, I assent to his conclusions throughout.

8. But I think we are justified in regarding this line purely *as a local line*. The Most Noble the Governor General has given it the sanction of his approval *as a local line*, and has recommended it (see paragraph 46 of his Minute of the 20th April 1853) in preference to the Poona line. His advice, even in paragraph 51, implies a conditional approval; for he recommends that it should not be resolved to carry such a line to Khandeish up the Ghauts, unless a survey of a line by the Taptec river should show the Ghaut line to be less objectionable than the river line.

9. It appears to me, that regarded *as a local line*, this fact has been established by the Reports before us; and if it can be shown that the port of Bombay requires, under any circumstances, the construction of the line over the Ghaut, that it is a paying line, and that there is a company prepared and anxious to complete it, I do not clearly see why these interests should be held to clash with imperial interests. I may ask why they should be sacrificed to another project, which is certain to succeed as a paying line if undertaken without reference to the Khandeish branch, and equally without reference to the port of Bombay, even though a junction by rail of the ports of Surat and Bombay should be judged to be politically necessary?

10. There is a separate company, as I understand, prepared to undertake this great trunk line, which only needs the sanction of authority to commence its work. Nor, as I fully admit, is there a line in this Presidency which is better calculated to provide for the commercial and the agricultural wants of some of the richest, most populous, and most extensive districts in India, and at the same time to subserve objects of the greatest political importance, and to advantage State economy.

11. But once more, I must express my humble conviction that it is *not the local line* to connect the Port of Bombay with the cotton districts of Khandeish and Berar, and must repeat, that *a local line has been distinctly recognized as necessary, and its construction recommended*.

12. It is on this head that I now request attention to the facts as they appear from comparing the two Reports of Colonel Kennedy and Captain Crawford. The latter officer has had the advantage of having gone over both projected lines, and no one who knows him will deny that his professional opinion is entitled to the greatest respect equally with the Colonel's.

13. Yet I hope it will not be supposed that I am disposed to over-value it.

14. His arguments that there are more places on the Thull Ghaut line with which it is desirable to open a communication, and that the line passes through a more healthy country, than that projected by Colonel Kennedy, I consider have been most conclusively met, and refuted as regards their assumed importance, by our Right Honorable President. In particular I believe, indeed, with His Lordship, that the Dang jungle would disappear in no very long period before the rail.

15. But he has established (as stated in paragraph 10 of his Report) *that of the two lines, that by the Thull Ghaut is the most direct by the difference between 260 and 390 miles, and that it occupies the present line of traffic, which are obvious, and, so far as they go, are decided advantages over the other line.*

16. He asserts, and his authority is good, that *omitting the Ghaut itself, it is mile for mile a cheaper line to construct*; correcting Colonel Kennedy by observing, in paragraph 23, that there is no Ghaut whatever on this line into Khandeish over the Chandore range.

17. He observes that there is every reason to expect that it will throughout be a paying line; and it is at least highly probable that the further this line is carried into Berar, the more certain would be this result.

18. He argues, on the other hand (see paragraph 43), that no commercial company, uninfluenced by the stimulus of a guarantee, would undertake the construction of that portion of Colonel Kennedy's line, 191 miles in length, which lies between Surat and Bombay. He shows that it passes eighteen large rivers, varying from 30 to 530 yards in width, besides innumerable ravines or nullas.

19. What this fact implies, and how far it constitutes an element in enhancing the cost of engineering work in this country, I shall endeavour, although it may be a digression, to make apparent. Colonel Kennedy, in the 6th paragraph of his Memoir, has argued in defence of his line, that there are no spurs from the Sahyadree range to pass over, and that he does not propose to cross estuaries.

20. But Colonel Kennedy had not, at the time he wrote his Report, nor has he ever that I know of, seen the country he describes during the periodical rains.

21. The Ghauts, it is well known, run nearly north and south in their line of general direction, parallel with the coast, and at a distance varying from 60 to 25 miles from the sea. Their average altitude may probably not be less than 3,000 feet. They have been well described by Captain Crawford, in paragraph 45 of his Report to Government of the 31st January 1853, as having been likened to a wall: "broken," he adds, "this wall is by huge chasms, and in places by projecting spurs." The annual fall of rain along this range during the months of June, July, and August principally, is enormous. To give some idea of the amount, I refer to Dr. Buist's valuable pamphlet on the Physical Geography of Hindustan, where he gives the fall at the pass of Khandalla, only 1,740 feet above the sea, at 168 inches, and at Mahableshwur, to the southward of Bombay, 4,500 feet, at 248 inches. The fall is not uniform, but violent and partial, and is greater as the range rises in height, at least to the height of 4,000 feet.

22. All this water, with the drainage of the Konkun itself, has to be swept away to the sea by the rivers and nullas of which we have spoken, and therefore we are justified in this case making a remark, which I find applied to another proposal of Colonel Kennedy's, that "of the works necessary for the protection of a line crossing at right angles the whole drainage of such a locality all must at present be surmise."

23. But to my mind the most important of all Captain Crawford's objections to Colonel Kennedy's plan, if regarded in the light of an approved local *scheme*, is to be gathered from his 17th and 41st paragraphs.

24. In the latter he remarks, that Khandeish cotton arriving at Surat by Colonel Kennedy's railway would be forwarded to Bombay by boat, unless the railway could carry it at $\frac{1}{2}d.$ per ton per mile; but this is too low an estimate. In the former he observes that nine-tenths of the traffic would stop at Surat.

25. Both assertions require some slight examination. From inquiries I have made, I may confidently assert that the cost of the transport of a ton of cotton per boat from Surat to Bombay is about Rs. 12-2-0, while the published rates of the Great Indian Peninsula Railway Company would make the charges of transporting a ton of cotton for the distance of 191 miles between Bombay and Surat—

For pressed cotton Rs. 17 14 6

For unpressed ditto 23 14 0

26. I am aware that these rates may be objected to as no authority. But I conceive that they were not fixed,—the pressed cotton at 18 pias per ton per mile, the unpressed at 24 pias ditto,—without a due consideration of the rates which the company could afford to charge for transit.

27. After making even a considerable allowance, it is highly probable, therefore, that cotton would not be transported from Bombay to Surat by railway, except during the monsoon.

28. The other assumption, that the cotton from Khandeish would stop at Surat altogether, or, in other words, be shipped from that port, is of still more consequence to the line of argument by which I have been considering the subject. It must be remembered that I have taken the confessedly limited view of a *local line*, the want of which has been felt and acknowledged, not only by the public who have formed a company to supply it, but also, as I have shown, by the Most Noble the Governor General of India.

29. The argument that Surat would become the port of the proposed branch line to Khandeish, indeed, seems to me to be almost admitted as a probable result of the construction of that line by Colonel Kennedy himself, as well as by our Right Honorable President.

30. The former, as observed by Captain Crawford, would seem to have projected the Bombay and Surat junction more out of deference to the wishes of the Governor General than as recognizing its necessity.

31. Colonel Kennedy states, indeed, pretty broadly, in paragraph 55 of his very able Memoir, that "if we seek to discountenance Surat and Broach, in order that we may carry certain articles 200 miles past those natural termini, we shall force upon them an additional cost of say from 8*d.* to 16*d.* a ton, which would be detrimental to all classes of goods, and be absolutely prohibitory to many of the lower kinds."

32. In every word of this I most cordially agree; and I see no reason why these cities should not again revive into life and opulence under the magic influence of rapid, certain, and cheap transit, effected by means of lines of rail, laid in a northerly and easterly direction.

33. Swallee Roads, the convenient anchorage to which old traders resorted, are as secure as ever for eight months in the year. No artificial harbour is necessary, even if it were practicable to construct one, as proposed.

34. His Lordship the President, on the other hand, remarks (see paragraph 8):—"If the facilities for shipping goods at Surat can be increased, so as to lead to the cotton, &c. brought by the railway being shipped there, as Colonel Kennedy anticipates, there is no reason, I suppose, why they should not be sent off at once to any part of the world in the same vessels," &c.

35. We must not forget that the argument used by Colonel Kennedy applies as strongly to the Khandeish branch line to Julgaum, and beyond it, as to the trade of Guzerat and the northern countries; for there is no question that the nearest direct line from Julgaum to the sea is in the

direction of Surat, and not of Bombay. The line projected would therefore be a *Surat local line, and Surat the port of shipment.*

36. But then the projected line ceases to be also a *local line for Bombay*; except in a very limited degree. It would even disturb and unsettle the Bombay trade, I imagine, to some extent; and whether with this magnificent harbour, and the recognized political advantages of the site, as the nearest point of communication with England and the seat of Government, it will be judicious to do this, is a point that may deserve a thought, though I here lay no great stress upon it.

37. There is yet another fact to notice, and which will have to be well considered at any rate when the northern line is sanctioned.

38. Colonel Kennedy brings his line from Julgaum close to Surat, and throughout it runs at no very considerable distance from the river Taptee.

39. Has it been considered how far this line may be affected by those great freshes or inundations which from time to time occur in that river?

40. To give some notion of what these freshes are, I refer to No. 12 Vol. I. of the Transactions of the Bombay Geographical Society for an account of the flood of 1837 (I was at the time in Guzerat), and which was certainly a heavier flood than any previous one not antecedent to the great flood of 1822.

41. The water rose in the Taptee river above its average level no less than 37 feet! There were 16 feet of water in one of the suburbs of the town. The breadth of the stream at Surat was six miles, says Major Fulljames, at the least, and in many parts double that distance. It was the prevalent report, indeed, that the Nerbudda and the Taptee had joined their waters, their distance apart being 40 miles—a circumstance which, at the stated height of rise of the water, is not improbable, the country between these rivers in the direction of Surat and Broach being a dead level of rich alluvial soil. The water was over many houses of the city, and high in nearly all of the houses. Captain Fulljames has given in this paper its height at the different city gates, and a large portion of the city wall was broken down.

42. In the case, then, of not unfrequent occurrence, nay the almost periodical occurrence, of freshes in the Surat river, as in guarding against the furious streams and torrents which pass from the Ghauts through the Northern Konkun into the sea, the railway engineers who construct this line will have to calculate the resistance and elevation of their works *for the excess, not for the average violence of the casualty.*

43. I do not urge the above argument as a special objection to this line, because in constructing a northern line it must be overcome; and I am as strong an advocate as the Right Honorable the President

himself for a great trunk northern line.' But it would be well to know exactly whether such a fresh would not affect the construction of the whole eastern extension (if it should be authorised from Surat to Julgaum by the Valley of the Taptee), or of any portion of it. . . .

44. I have stated above what appear to me to be serious difficulties as well as disadvantages, and also sources of costly expenditure, which will probably be entailed upon the Great Indian Peninsula Railway Company by a decision compelling them to construct their Khandeish line of rail by the way of Surat, if they do not decline the construction of it altogether. No doubt, as the great northern line became extended, an equivalent would be found for its special disadvantages, as far as Khandeish is concerned, in the traffic and produce of Guzerat and the very rich countries adjacent. Passenger traffic especially has been pointed out as likely to prove highly remunerative. But if Surat and Broach were ever to revive under the influence of railways as exporting marts, a great deal of the northern trade would no doubt be intercepted, and the interests of this port would proportionately suffer.

45. On the other hand, the Ghaut line already laid down presents but a solitary disadvantage, and would in all times to come, whatever railways may be subsequently constructed, fulfil its purpose as a local line for Bombay, and a most material agent in promoting the prosperity and commerce of this Presidency.

46. The only objection to which I have referred is apparent—it is the Ghaut ascent; but the difficulty will be surmounted, I feel assured, as surely as the genius of our Stephensons and our other distinguished civil engineers has surmounted all difficulties that have been opposed to their undertakings, so that it has been said with some truth in these days to have vanquished time and space, and to have conquered nature. Nor is the difficulty without its parallel. In a late publication, mention is made of a railway which is carried over a steep ascent from the banks of the Ohio to the high plain of Indiana, from the town of Madison. "Formerly," it is stated, "this inclined plane was worked by stationary engines; but a workman, Mr. Catheart, overcame the difficulty, by placing between the two rails a third rail, with cogs corresponding to a wheel in the centre of the waggons, and he received 6,000 dollars for his patent."* Whether some such device be or be not found applicable in the Ghaut incline, I content myself with once more expressing my firm conviction that the difficulty will be overcome.

47. The expediency of not refusing the sanction of authority, or denying the benefits of the guarantee to the local line by the Ghaut, which I think has been shown to be *the true and only direction for a local line from Bombay to Khandeish*, is further established, to my mind,

* Pulsagky—White, Red, and Black, Vol. II. p. 148.

by a very important consideration to which Captain Crawford refers in the 10th paragraph of his Report.

48. The first company, he observes, was formed, and their capital subscribed, with the distinct and legitimate object of opening a direct communication between Bombay and the cotton districts of Khandeish and Berar.

49. By the abandonment of the Ghaut line this object is sacrificed, the local line abandoned, and the funds subscribed diverted to construct a line which will doubtless prove eventually highly remunerative, but which will not fulfil the purpose for which the first line was devised.

50. In stating what I have thought it my duty to state in favour of local interests, and the local line, I beg once more that I may not be understood to be blind to the great interests so strongly advocated by our Right Honorable President in connection with the construction of the northern railway. I once more repeat, that I subscribe to every word advanced both by him and by Colonel Kennedy on this subject: I trust to see the work taken up, and vigorously prosecuted; and assuredly it will be, if completed, a great imperial work, as beneficial to *the interests of commerce* as to those of the State.

51. In regard to the northern trade, I may notice that Colonel Kennedy in his 55th paragraph makes the value of the exports and imports from the ports of Guzerat for the year 1852-53 to amount to £3,513,148. I should have thought he had even understated the amount, if he had not referred to the Custom House returns. I annex, as it may be considered of interest, a return called for by this Government a short time back, showing the quantity and value of the import and export trade at the ports of Gogo, Bhownuggur, Bhowleearce, and Khoon, four comparatively petty bunders in the Gulf of Cambay, through which the trade of Guzerat straggles up and down by the line of Ahmedabad and Palec, and by which it finds an outlet.

52. The trade of these four ports alone, it will be seen, amounts to Rs. 2,42,05,696, or to nearly two and a half millions of pounds sterling. The trade of the great ports of Guzerat—Tankaria, Cambay, Broach, and Surat—is not included.

53. I conclude by again pleading a sense of duty as my excuse for the foregoing remarks—they are at least disinterested: I neither possess, nor ever have possessed, a single railway share, or a share in any commercial enterprise or company whatever, connected with this port.

54. The line by the Ghaut can never be a trunk line, as the Governor General has decided the point; but it is, I conceive, the *best local line* for the interests of the port: and having been conditionally approved as such, and its necessity admitted, and a Company engaged in constructing it, I cannot see why the capital subscribed should be

diverted into a different channel; nor do I see why it should be applied to an undertaking, which, however magnificent in its design, and important as well as lucrative in its probable results, I think, with much deference, is not likely to fulfil effectually the object of the subscribers.

55. And I am further of opinion, that even should Colonel Kennedy's scheme be carried out in its integrity, and a guarantee refused to the Great Indian Peninsula Railway Company upon the construction of their projected line into Khandeish, the want of such a line will be severely felt at this port—I am bound to add, to a degree which may possibly lead in time to the rail being completed without any guarantee whatever by the present surveyed route over the Ghaut into Khandeish.

(Signed) J. G. LUMSDEN.

2nd September 1854.

FURTHER MINUTE BY THE RIGHT HONORABLE THE
GOVERNOR, DATED 2ND SEPTEMBER 1854.

I am happy to find that there is so much coincidence of opinion between my honorable colleagues and myself upon the relative importance of the Baroda and Thull Ghant lines of railway.

2. As a Government, we are clearly bound to support in the first place the plan which promises to be of the greater general utility, but it does not follow that we should overlook or undervalue the local interests which the other project is intended to promote.

3. Notwithstanding the difficulties which the inundations in the neighbourhood of Surat may occasion, I think that it may be taken for granted that the cotton of Berar and Khandeish would be more cheaply conveyed by the Taptee Valley line to Surat, than it could be by the longer route of the Thull Ghaut to Bombay. The question, therefore, as regards those provinces, seems to be this—Will the saving in the cost of transport by the shorter and more level line to Surat counterbalance the advantages which Bombay offers as a port of shipment? Here we possess one of the finest harbours in the world, plenty of ships, warehouses, and all the commercial facilities which result from extended enterprise and superior wealth.

4. If these advantages outweigh the saving in the cost of transport, which Colonel Kennedy estimates at from 8*d.* to 16*d.* per ton, the case of the Thull Ghaut line as a local line is established; and I think it is extremely probable, that the anticipation contained in the last paragraph of Mr. Lumsden's Minute will be realized, and that it will be completed *without any guarantee whatever* by the route now surveyed by the Great Indian Peninsula Railway.

5. If, however, the advantages of bringing the cotton to Bombay for shipment are not so conclusive, the Honorable Court will, no doubt, be called upon to guarantee the Thull Ghaut as a local line.

6. In this case, I conceive that it would be advisable to defer giving the guarantee until some progress has been made in the works on the Bhore Ghaut, the plans of which I understand are nearly completed, and present less objectionable features both in the curves and gradients than the Thull Ghaut. I entirely agree with the Honorable Mr. Lumsden, that the difficulties of surmounting the Sahyadree range will be overcome by the skill of the engineers employed; but I think if a

second railroad is to made over this formidable barrier, it would be well to profit by the experience which will doubtless be acquired in constructing the first.

(Signed) ELPHINSTONE.

2nd September 1854.

FURTHER MINUTE BY THE HONORABLE MR. WARDEN,
DATED 6TH SEPTEMBER 1854.

If the question before us had been merely the comparative advantages of Colonel Kennedy's and Major Crawford's lines as *local lines*, I am disposed to think we should have been unanimous in selecting the latter; but if I understand the intentions of the Most Noble the Governor General and of the Honorable the Court of Directors aright, *local lines* are to be postponed to *imperial lines*: and such being the case, we are bound, as a Government, to advance the line proposed by Colonel Kennedy, in the first instance.

(Signed) J. WARDEN.

6th September 1854.

FURTHER MINUTE BY THE HONORABLE MR. LUMSDEN,
DATED 6TH SEPTEMBER 1854.

I will not detain these papers. I will only observe, that though the Ghaut line to Khandeish be regarded as a local line, I question, from its vital importance, not only to this port, but to the prosperity of the country, and to existing interests affected by a decision, whether it comes within the classification of local lines which the Most Noble the Governor General has decided are to be postponed.

There is another point which may also deserve consideration, in connection with my former remarks—the disadvantages of delay in the construction of a confessedly profitable and generally useful line. We have no data whatever on which to estimate the cost of Colonel Kennedy's line: at least another year must elapse before we can

procure any reliable data. On the other hand, I am told we may expect shortly (within a month or two) Mr. Berkley's Report on a most admirable line (which has been surveyed and generally approved) into Khandeish, and for which the estimates are in a very forward state, and will, when completed, show the cost of every bridge, drain, and culvert along its course.

(Signed) J. G. LUMSDEN.

6th September 1854.

**FURTHER MINUTE BY THE RIGHT HONORABLE THE
GOVERNOR, DATED 6TH SEPTEMBER 1854.**

The additional Minutes should, I presume, be transcribed and forwarded to the Supreme Government, and it should be explained that the line alluded to by Mr. Lumsden, upon which we may shortly expect a further Report, is the Thull Ghaut line.

(Signed) ELPHINSTONE.

6th September 1854.

No. 321 of 1854.

FINANCIAL DEPARTMENT
(*Railway Branch*).

From H. E. GOLDSMID, Esq.,

Officiating Chief Secretary to the Government of Bombay,

To C. ALLEN, Esq.,

Officiating Secretary to the Government of India.

Dated 6th September 1854.

SIR,

The Most Noble the Governor General of India in Council has already been furnished with a copy of Colonel Kennedy's Report, and its accompanying plans, &c. relative to the lines of railway in this Presidency, which the Bombay, Baroda, and Central India Railway Company undertook to survey.

2. This Government were also furnished by Colonel Kennedy with a copy of the same papers, and they were at once placed before Major Crawford, the Consulting Engineer, for his opinion.

Report by Major Crawford, No. 118, dated 31st May 1854.

Minute by the Right Honorable the Governor, dated 18th July 1854.

Minute by the Honorable Mr. Warden, dated 29th July 1854.

Minute by the Honorable Mr. Lumsden, dated 2nd September 1854.

Further Minute by the Right Honorable the President, dated 2nd September 1854.

Ditto by the Honorable Mr. Warden, dated 6th September 1854.

Ditto by the Honorable Mr. Lumsden, dated 6th September 1854.

Ditto by the Right Honorable the Governor, dated 6th September 1854.

in extenso, instead of it being attempted to incorporate their substance in the present letter.

3. Copy of Major Crawford's Report, and of the Minutes recorded on the subject by the Right Honorable the President and the Civil Members of Council, are herewith submitted for the consideration of the Government of India.

4. And I am desired to express a hope that, on this occasion, the Government of India will be of opinion that there was sufficient reason for the accompanying papers being forwarded

I have the honour to be, &c.

(Signed) H. E. GOLDSMID,
Officiating Chief Secretary to Government.

Bombay Castle, 6th September 1854.

No. 1159.

HOME DEPARTMENT
(*Railway*).

From C. ALLEN, Esq.,

Officiating Secretary to the Government of India,

To H. E. GOLDSMID, Esq.,

Officiating Chief Secretary to the Government of Bombay.

Dated the 3rd November 1854.

SIR,

I am directed to acknowledge the receipt of your letter No. 321, dated 6th September last, transmitting observations by Major Crawford, the Consulting Engineer, and Minutes of the Right Honorable the Governor of Bombay, and of the Members of Council, upon the Report submitted by Colonel Kennedy on behalf of the Bombay, Baroda, and Central India Railway Company.

2. The Most Noble the Governor General desires me to acknowledge his obligations to the Governor of Bombay, and to the Honorable Mr. Lumsden, who have discussed this important question with so much ability, care, and local knowledge, as to have rendered the discussion itself complete, and to have left him little more to do than to record the conclusions to which he has come.

3. The Governor General in Council is no less desirous of acknowledging his obligations to the Consulting Engineer, Major Crawford: although His Lordship in Council finds himself unable to concur in some of his views, they will deserve the attentive and respectful consideration of all.

4. Colonel Kennedy has proposed that a railway should be constructed from Bombay by Surat and Broach to Baroda; and that from Baroda the line should be carried onwards, either by way of Neenuch to Agra, or further to the westward by way of Ahmedabad, &c. to Delhi. Preliminary surveys of the line from Bombay by Baroda and Neemuch to Agra have been made. As yet no survey has been made of the alternative line from Baroda to Delhi by way of Ahmedabad.

5. In connection with this main line, Colonel Kennedy has proposed various branches to Indore, &c. He has also proposed a very extensive branch line, whereby a communication would be opened between Khandeish and the port of Surat, by way of the Valley of the Taptee river.

6. The leading object of the Company, which Colonel Kennedy represents, is to carry into execution that portion of the scheme for railways in India which recommended that "a junction line should be formed between the trunk line in Bengal and Hindustan and the Presidency of Bombay, either by the Valley of the Nerbudda, or by way of Baroda and Neemuch, but preferably by the latter in the first instance, if further examination should recommend it." (Governor General's Minute, dated 20th April 1853, p. 99.)

7. The main question, therefore, for the consideration of the Government of India, is, whether the project submitted by Colonel Kennedy is well calculated to form the junction above described, and whether it should now be sanctioned wholly or in part.

8. There is also an important, though secondary, question for consideration, viz. whether the line from Surat by way of the Taptée Valley into Khandeish, proposed by Colonel Kennedy, should receive the sanction of the Government of India, in preference to the line from Bombay into Khandeish by way of the Thull Ghaut, which has already been proposed by the Great Indian Peninsula Railway Company.

9. However widely the opinions before the Governor General in Council relative to the several schemes projected by Colonel Kennedy may differ upon some points, all unanimously concur in holding, that if a junction is to be formed between the Western Coast and the railways of Bengal and Hindustan, the line between Baroda and Bombay ought to receive the sanction of the Government of India, as the best suited for effecting that purpose.

10. Under the power given to the Governor General in Council by the Honorable the Court of Directors, His Lordship in Council has been pleased to sanction the immediate construction of the line from Bombay by Surat and Broach to Baroda, by the Company which has projected it; and His Lordship in Council also sanctions the continuation of the line from Baroda to Ahmedabad, leaving for future decision the question whether it should be considered part of the main line, or a branch line. Beyond this, His Lordship in Council is not prepared to go at present, but requests the Bombay Government to direct the prosecution of surveys between Baroda and Agra, and Baroda and Delhi, with a view to discover the best line of junction between the Presidencies of Bengal and Bombay.

11. As it may be found impracticable to construct an eligible line either by way of Neemuch to Agra, or by way of Ahmedabad to Delhi, and as a connection with the Nerbudda Valley is in itself of great value to the proposed trunk railway, as well as to all that tract of country, His Lordship in Council requests that a further survey be instituted, for the purpose of ascertaining whether the line by the Taptée Valley

or a line by the northern bank of the Nerbudda be more favourable for the formation of a communication eastwards.

12. His Lordship in Council also requests that the Great Indian Peninsula Railway Company be urged to complete their examination of the Thull Ghaut line, in order that the Government of India may have before it all the materials necessary for forming a judgment regarding the best line of communication between Bombay and Khandeish.

13. The point mooted by Colonel Kennedy, relative to the working of the Nerbudda iron mines, by the railway company which he represents, will be submitted for the consideration and orders of the Honorable the Court of Directors.

I have the honour to be, &c.

(Signed) C. ALLEN,

Officiating Secretary to the Government of India.

Fort William, the 3rd November 1854.

SELECTIONS FROM THE RECORDS OF THE BOMBAY
GOVERNMENT.

No. XI.—NEW SERIES.

REPORT
ON THE
SANITARY STATE AND SANITARY
REQUIREMENTS OF BOMBAY.
(WITH APPENDICES.)

BY
H. CONYBEARE, Esq.

Bombay:
PRINTED FOR GOVERNMENT
AT THE
BOMBAY EDUCATION SOCIETY'S PRESS.

1855.

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REPORT ON THE SANITARY STATE AND SANITARY REQUIREMENTS OF BOMBAY.

No. 74 OF 1852.

TO GEORGE HANCOCK, Esq.,

Clerk to the Board of Conservancy.

SIR,

I have the honour to acknowledge the receipt of your letter No. 37 of 1852, stating that you are directed by the Committee appointed by the Worshipful Bench to consider and report upon the income and expenditure of the Municipal Fund, to request me to submit, as soon as possible, to the Board of Conservancy, a statement whether any and what public improvements are urgently and immediately required for the improvement of the island, accompanied by a rough estimate of the probable expenditure involved ; and that *I should submit, at the same time, the grounds on which I consider such improvements to be of urgent importance.*

2. To prepare an answer in detail, and at a length commensurate to the importance of the subject, to a question so voluminous as the foregoing, would require more time than I believe the Committee could afford to wait. I am given to understand, however, that their object in calling for the statement in question is merely to ascertain whether the municipal revenue bears such a proportion to the urgent and immediate sanitary demands upon it as would justify the Committee in recommending the alienation to other purposes of funds hitherto appropriated to a class of improvements, the immediate result of which (as I shall presently prove) is to reduce by 20 per cent. the *average* death-rate of the streets in which they are effected ; and the information requisite for answering the question to this extent can be afforded without delay.

3. The Committee have requested, that in forwarding a list, ac-

accompanied by a rough estimate of the probable expense of the public improvements urgently and immediately required, I would submit at the same time the grounds on which I consider such improvements to be of urgent importance. I am sure that the Board of Conservancy will be of opinion that all improvements, the postponement of which can be proved to be attended by an annual and considerable loss of human life, *must* be considered as "immediately and urgently required." I shall therefore endeavour to show, in the *first* instance, that there are sufficient grounds for arriving at the conclusion that one-half (or about 8,000) of the deaths that annually occur in Bombay are due to various removeable causes, and that the drainage of undrained streets would, according to the highest English authorities, of itself, and irrespective of all other sanitary improvements, reduce our annual death-rate by at least 20 per cent. or about 3,000 souls a year; and then proceed to consider the accompanying list and rough estimate of the more prominent of the improvements requisite for obtaining so desirable a result.

4. The present sanitary movement in England is even there of very recent origin, and the great importance of the subject has been as yet scarcely recognized in India. The elaborate data for sanitary reform afforded in England by the lucid and voluminous reports of the Registrar General, of the Parliamentary Commissions for inquiring into the health of towns, and the similar reports of municipal corporations and private associations, are altogether wanting here; we are, indeed, without the first basis for sanitary statistics—a trustworthy census, and annual mortality return; our town, with half a million of inhabitants, is not divided (as for half a dozen municipal and sanitary purposes it ought to be) into any *generally recognized* districts and sub-divisions; the houses have one number for police and census, and another number for house assessment. There is, in fact, a general want of unity and system. The assessed value of houses in each particular street, as compared with its population and mortality, always forms a most important and instructive element in sanitary statistics, but the house assessment returns at Bombay are now so taken as to be altogether inapplicable to such a purpose, and no complete or systematic surveys or levels have ever been taken of the town. The Native Town is, moreover, as regards its position, most unfortunately situated for being known to, or for interesting the educated and more influential classes (whether Native or European) of our community. The principal acquaintance of these classes with the Native Town is generally formed by traversing the Kalkadavee or Girgaum bazar roads, in going from the country into the Fort, or from the Fort into the country; and of all the densely-peopled districts lying *behind* these great thoroughfares they generally know as little as they do of the interior of Africa.

5. In the absence of equally complete local data, I must have recourse *principally* to English sanitary statistics, to show what would be the effect of sanitary improvements in diminishing the annual death-rate of Bombay ; but I think that such English data will be *allowed* to be perfectly applicable to the case ; for if it be shown that the existence of open drains and cesspools, &c. in a crowded English town invariably occasions a certain, specific, and very considerable increase in the mortality of their neighbourhood, it cannot be supposed possible that similar nuisances should prove less deleterious when exposed to a tropical sun, in an atmosphere so surcharged with moisture as that of Bombay, and that, too, in a town over-crowded (as regards the number of square yards to each inhabitant) *far beyond all European precedent*.

6. From the reports of the Registrar General it appears, that if we compare one million of the inhabitants of the large towns with the same number of the inhabitants of the rural districts, the inhabitants of the towns lose nearly 8,000 more every year than the inhabitants of the country (the exact number is 7,773). This is the general average of the whole of the one class as compared with the whole of the other, taking healthy and unhealthy towns, and healthy and unhealthy rural districts together. But the rate of mortality differs much in different towns and districts : for instance, on the average Mortality Returns of 1840, 1841, and 1842, as compared with the population by the Census of 1841, the general annual death-rate of the healthiest rural districts in the North of England was only 14 per 1000, and that of the healthiest towns 20 per 1,000 ; Halifax and Kidderminster were 21 per 1000 ; London 25 per 1000 ; Preston 29 per 1000 ; Hull and Leicester 30 per 1000 ; Bristol 31 per 1000 ; Manchester 32 per 1000 ; and Liverpool 35 per 1000.

7. The Registrar General's reports also show the effects of the unhealthiness of towns on the average duration of life : the inhabitants of London lose eight years of their lives, as compared with the population of the rural districts, and the inhabitants of Liverpool eighteen years. The unhealthiness of a town increases the mortality of the infant population in a very much higher *ratio* than that of the adults. If we compare the healthier rural districts of England with the Metropolis, it will be found that in the former localities children under five years die at less than double the average rate for all ages, and in London at more than four times that average ; in other words, if the population be divided into two classes as regards age, the first consisting of all aged above five years, and the second of infants under five, it will be found that in the healthier districts, the mortality of the first class is only 12 per 1000, and that of the second 26 per 1000 ; but that in London the

death-rate of the first class is 15 per 1000, and that of the second 107 per 1000. In English towns and districts, children under five years constitute from one-seventh to one-ninth of the entire population; in Bombay, the proportion of infants is probably very much less.

8. All parts of large towns are not equally unhealthy : amongst the inhabitants of first class houses in first class streets, the annual death-rate is as low as 18 per 1000, and in the worst class streets and houses as high as 40 per 1000; in confined alleys and courts reaching even 54 per 1000. In Bombay, the difference between the death-rate in the healthiest and most unhealthy districts is considerably greater : this may be perhaps attributed to the greater density of our population, a circumstance always found to increase very greatly the mortality of undrained districts.

9. It being thus rendered apparent that the annual death-rate of large towns very greatly exceeds that of rural districts, the question naturally suggests itself—What proportion of this excess is “preventable,” and how many lives may be saved annually by precautionary measures?

10. The sanitary statistics that have been so industriously collected in England since 1838 afford data for answering this question most satisfactorily. “I have no hesitation,” says Dr. Simon, one of the Surgeons of St. Thomas’s Hospital, and the Medical Officer of Health to the City of London, in his last year’s (1850-51) Report on the Sanitary Condition of the City of London, “in renewing an assertion of my last year’s report, that *if the deliberate promises of science be not an empty delusion, it is practicable to reduce human mortality within your jurisdiction to the half of its present average prevalence.*”

11. In another portion of the same report, Dr. Simon says : “I need not inform your Honorable Court, that this death-rate (24.480 per 1000) is unduly high. I have already in previous reports laid before you the materials for measuring its excess—materials which seem to show that our existing death-rates are nearly the double of that which better circumstances have elsewhere rendered attainable.

12. “It is not to the city alone of metropolitan districts that this high mortality belongs. Unhappily, it affects the entire Metropolis, and we may find other towns in England, and still more on the Continent, where the death-rate is higher than under your jurisdiction; yet your Honorable Court will not doubt that the standard to be adopted for your estimate of healthiness ought to be the lowest known death-rate; and every avoidable death is an unqualified evil to society; and that *if a mortality of 12, 13, and 14 per 1000 per annum can be reached for one mixed population, there is ample room for discontent among any other*

population which finds itself doomed to perish at double the rate of the first."

13. The excessive mortality of ill-conditioned towns can be proved to be due in every case to some or all of the following causes: deficient sewerage; low and damp situation; over-crowding; defective ventilation; deficient scavenging; defective water supply; *ill-devised arrangement of dwelling-houses*; the practice of offensive and injurious trades; the putrefaction of intramural burial-grounds; and the like; all of which causes of increased mortality ought to be—and few of which are—provided against by our local enactments. At present, I shall only consider the amount of "preventable deaths" due to the first of the above causes—the want of covered street-drainage.

14. I have already alluded to the sanitary movement in England as having supplied authentic data for determining the causes of the excessive mortality of towns, and the best means of prevention. I shall now proceed to give a rapid sketch of the origin and progress of this movement, and of its practical results in the three-fold improvements it has effected: *first* of all, in the legislative enactments relating to the subject; *secondly*, in the admirably organized system of municipal establishments which have since been introduced in most large English towns; and *thirdly*, in the great reduction in the cost of works and town-drainage that has resulted from the experimental works of the Parliamentary Commissioners.

15. The sanitary movement in England originated in the reports of the Poor Law Commissioners, and may be said to date from 1838. In that year, Drs. Southwood Smith, Arnot, and Kay, acting under the Poor Law Commission, first directed attention to the deplorable condition of the districts of the Metropolis inhabited by the poorer classes, and to the ravages of fever and other fatal diseases in these localities. These inquiries were followed up by a Committee of the House of Commons in 1840; then again by Mr. Chadwick, who, also acting under the Poor Law Commission, having carried on still more extended investigations during the years 1840 and 1841, presented the results in the Sanitary Report of 1842. In 1843 the Queen appointed Commissioners "to make further inquiries into the actual state of large towns and populous districts, and to devise the best means of promoting and securing the public health."

16. Their first report was published in 1844, and it has been followed by others of equal value. The Metropolitan Sanitary Commission was appointed in 1847, and the first of their series of blue books appeared at the close of the same year. The General Board of Health in 1849 and 1850 issued voluminous reports on the water supply, and on the measures adopted for the execution of the "Nuisances Removal and

Diseases Prevention Act," and the "Public Health Act;" and several supplementary reports on various subjects connected with the public health, prepared by Mr. Chadwick (now a C.B.) and others at the request of the Secretary of State, have been published by order of Parliament.

17. The importance which the English Government attached to these inquiries was evinced by a paragraph in the Speech from the Throne at the opening of the Sessions of 1845, and by the Queen's rewarding those who had taken the most active part in the inquiry with the ribbon of the Bath.

18. The movement made as much progress out of doors as in Parliament. In the Metropolis an association was formed "for the purpose of diffusing a knowledge of the circumstances that injuriously affect the health and lives of the inhabitants of towns, and of the means by which the one may be preserved, and the other protected."

19. Amongst the Committee of this association were the Marquis of Normanby, B. D'IIsraeli, Sir E. L. Bulwer, Lord Ebrington, Lord Ashley, Sir R. H. Inglis, Lord J. Manners, Lord Francis Egerton, Lord Robert Grosvenor, Lord Morpeth, R. Lalor Sheil, half a dozen Bishops and Deans, Lord Dudley Stuart, Lord Loyelace, and most of the Members of both Houses of Parliament who had shown any interest in the welfare of the masses. There were also amongst them several eminent practical men—engineers, architects, and physicians; amongst the latter Sir J. Clarke, Dr. Southwood Smith, Dr. J. Simon, and Dr. Guy. With the same object, similar associations were formed in the principal towns, and the working classes (the principal sufferers by the neglect of sanitary measures) formed among their own body an association for the same purpose.

20. A strong proof of the hold which this great movement had taken on the public mind was afforded by the fact of Lord Ebrington assuming the office of lecturer, and becoming a public teacher of the important truths revealed by the labours of the Health of Towns Commission.

21. The practical utility of Royal Commissions and Parliamentary Committees has often been doubted, on the ground that the blue books to which they give birth, though frequently exposing the existence of very serious evils, usually only suggest remedies which under the circumstances are either impracticable, or which present so many difficulties in execution as to render it highly improbable that they should be even carried into useful effect. This was, however, not the case with the inquiries of the Health of Towns and Sanitary Commissions. The Committee of the association I have mentioned above delivered in 1846 the following opinion regarding the value of these reports:—

22. "The result of these various inquiries has been the collection of

a body of evidence of the highest order, relative both to the extent and intensity of the evils in question, and to the proper legislative remedies ; and the publication of this evidence will, in the opinion of your Committee, form an era in the history of legislation, there being no other instance known to them in which evils of so much magnitude have been proved to be so generally prevalent ; in which the search after efficient and permanent remedies has been attended with a success so unquestionable and so unquestioned ; in which the mode of giving practical effect to those remedies has been so satisfactorily shown ; and, consequently, in which so much has been done, at once to guide the legislature, and to instruct and prepare the public mind for cordial co-operation with it."

23. This encomium on the practical character of these inquiries has been fully justified by their results, the first and most important of which was the passing of a series of admirably devised general and local Acts of Parliament for facilitating the prevention of disease and nuisance, the regulation of buildings, and the construction of drains in large towns, and also for constituting the machinery and organizing the establishments by which these desirable objects were to be carried out in each locality. In 1844, the Metropolitan Building Act was passed, a similar Act for the regulation of buildings in large provincial towns having been previously introduced by Lord Normanby ; Lord Lincoln's Sewerage and Drainage, &c. of Towns Bill was introduced in 1846 ; the " Nuisances Removal and Diseases Prevention Act" became law in 1847 ; and the " Public Health Act" was passed about the same time ; and in 1848 an Act to amend the Nuisance Removal, &c. Act was introduced. Numerous supplementary local Acts of Parliament were also passed for meeting the peculiar requirements of particular towns in respect to the regulation of buildings, and the prevention of nuisances.

24. It was stated in paragraph 14 that the improvements resulting from the sanitary movement in England had been three-fold ; 1st, as regards the legislative enactments on the subject ; 2nd, in respect to the organization of the municipal establishments for carrying out the former ; and 3rd, in the constructional details of works of sanitary engineering. Having shown its effects in the improvement of the legislative enactments on the subject, I shall now proceed to give a sketch of the improved system of municipal establishments it was the means of introducing, and which is now generally adopted in most large English towns.

25. In Bombay, as in all other large towns which possess a revenue, and maintain establishments for the purpose of promoting the health and convenience of the inhabitants, such establishments have three distinct functions, which are performed under three distinct local Acts.

The 1st of these functions is that of an executive engineer's establishment; namely the design and construction of new roads and sanitary works, and the repair and maintenance of the old ones. This is done at Bombay by the Superintendent of Repairs,* under Act No. XI. of 1845, and the annual amount of such executive expenditure is about equal to that of the whole road and tank department. The 2nd is "the regulation of buildings." This is effected by the Surveyor to the Court of Petty Sessions, under the Building Act, No. XXVIII. of 1839. The 3rd is the prevention of nuisance, and this is also done by the Surveyor to the Court of Petty Sessions, under the Nuisance Act, No. XIV. of 1842.

26. In large English towns, the executive engineering work of the municipality, the regulation of buildings, and the enforcement of the Nuisance Act, are effected by three distinct municipal officers, having distinct establishments and distinct duties. The *first* of these is styled differently in different towns either "Borough Engineer," or "Engineer to the Committee of Health," &c. However styled, the duties of this officer are in all cases solely those of an executive engineer.

27. *Secondly*, a public officer is appointed, called the "Inspector of Nuisances," armed with sufficient power "to enforce obedience to the law," and "provided with a distinct establishment for the purpose."

28. *Thirdly*, a "Surveyor of Buildings" is appointed, provided with powers and establishment adequate to the enforcement of the local Building Acts, which in England are always very much more stringent than in Bombay, a circumstance to which the greater regularity of streets and buildings in English towns is to be attributed. The Surveyor of Buildings and his establishment is principally remunerated by fees, varying in amount for the various classes of buildings; if the town is large, it is divided for the purposes of the Building Act into separate districts, and a Surveyor of Buildings appointed to each.

29. In most large English towns there is a fourth functionary appointed—"A skilled and responsible medical officer," called the "Medical Officer of Health"; his duties are "to ascertain the true causes of disease and death, and more especially of epidemic diseases, in the various districts of the town."

* The Superintendent of Repairs is appointed by the Bench, subject to the approval of Government, who confirm his appointment only on the condition of his discharging the duties of a Government appointment, that of Surveyor to the Court of Petty Sessions, "gratuitously." This arrangement being made, the Superintendent of Repairs is forthwith gazetted as "appointed by the Governor in Council Surveyor to the Court of Petty Sessions," his establishment in such capacity being still paid from the treasury, and not from the Municipal Fund. The inconvenience that would otherwise arise from the double capacity of the Surveyor to the Court and Superintendent of Repairs, and the double authority under which he acts, is in great measure obviated by the Court of Petty Sessions and the Board of Conservancy having the same Chairman.

30. The system of annual sanitary reports now usually adopted in most large English towns is attended by great advantages. It is as follows:—The Borough Engineer, the Inspector of Nuisances, and the Medical Officer of Health, each forward annually to the supervising body (corresponding to the Board of Conservancy at Bombay) a report of the present sanitary state of the town, and of the progress of improvement during the past year, as far as regards his own particular department. These reports are printed, and handed up by the supervising board, with any comments it has to make on them, to the higher authority.

31. These reports are most valuable, in diffusing amongst the public a well-informed interest in the sanitary progress of the town. They contain a concise and intelligible exposition of its present sanitary state, and past year's progress; every statement being supported by the authority of figures and statistics, (the actual rate per foot or yard at which each improvement or repair has been effected is given and compared with the corresponding rate in former years, and with that given for similar work in the similar reports of other municipalities,) the still existing sanitary deficiencies of the town are pointed out, with the remedies proposed. Any improvement effected in the machinery for the enforcement of the Building and Nuisance Acts is detailed, and any deficiencies in the enactments of either Act that have manifested themselves during the experience of the past year are pointed out, and codicils to the Act suggested to remedy them.

32. I now come to the third species of improvements that has resulted from the inquiries of the various royal commissions, and from the experimental works of the recently appointed "Consolidated Commission of Sewers for the Metropolis." These improvements principally consist in the adoption of a new form of section, "the oviform" (much more economical and effective than the old one), for large and middling-sized sewers, and of "tubular drains" of glazed stone-ware for the smaller ones, the course of the drainage being at the same time rendered as short and direct as possible, and the section of each drain being proportioned to the amount of sewerage it is required to carry off. The economical result of these improvements is thus stated in one of the reports of the General Board of Health in 1850:—

33. "The late George Stephenson reported upon the drainage of Carlisle, and estimated the expense of street sewers at upwards of £70,000: upon the recent investigations of our Engineering Inspector, Mr. Rawlinson, it is estimated that the whole city may be far more efficiently drained for £10,000. At Southampton, the expense of draining the town had been put at upwards of £51,000; our Engineering Inspector, Mr. Ranger, calculates that on the improved plan it may be

accomplished for £26,000. A very complete plan, with some improvements, had been laid out for Reading, at an expense £60,000; our Engineering Inspector, Mr. Lee, is confident that the improved drainage works, including complete house-drainage, may be executed for little more than £25,000."

34. The improved system of municipal establishments, sanitary enactments, and sanitary engineering, now generally adopted in large English towns, will be described at greater length, and the applicability of such improvements to the peculiar circumstances of India and Bombay examined, in the Appendices to this Report; I shall at present proceed to point out the causes which have been proved by the sanitary inquiries instituted in England to increase the mortality of the inhabitants of towns, and shall endeavour to show that similar causes produce similar effects in Bombay also.

35. Dr. Southwood Smith, the Physician to the London Fever Hospital, a Member of the Sanitary Commission and General Board of Health, and distinguished for the leading part he has taken in the sanitary movement, in speaking of the effect of sanitary improvements (drainage particularly) in diminishing the mortality of towns, says:—"The records of the London Fever Hospital prove indubitably that there are certain localities in the Metropolis and its vicinity which are the constant seats of fever. * * * The districts in which fever prevails are as familiar to the physicians of the Fever Hospital as their own names.

* * * * *

36. "In every district in which fever returns frequently, and prevails extensively, there is uniformly bad sewerage, a bad supply of water, a consequent accumulation of filth; and *I have observed this to be so uniformly and generally the case, that I have been accustomed to express the fact in this way: if you trace down the fever districts on a map, and then compare that map with the map of the Commissioners of Sewers, you will find that wherever the Commissioners of Sewers have not been, there fever is prevalent, and, on the contrary, wherever they have been, there fever is comparatively absent.*"

37. The data afforded by the census and mortality returns of Bombay prove that Dr. Smith's remark applies to this town as stringently as to London. The Police Surgeon, Dr. Watkins, has recently made a report to the Medical Board, which has been forwarded through Government to the Board of Conservancy, on the ratio of annual mortality (from cholera) among the population of the various police divisions of the island. It is to be regretted that the tables illustrating this report are not calculated for less extensive districts than the great police divisions, some of which contain a population of more than 100,000, and include well-drained as well as undrained districts; yet, notwithstanding

this, the result is sufficiently remarkable. The ratio of last year's cholera deaths to population was, in the A Division, containing the three sub-districts of the Fort, the Esplanade, and Colaba, as compared with that of the E Division, containing Mazagon, Tarwary, *Cammatee Poora*, Parell, and Sewree, only as 4 to 14. Dr. Watkins correctly attributes this excessive mortality of the E Division to the circumstance of the filthy sub-division of *Cammatee Poora* falling within it; and "to no one," he remarks, "who is acquainted with the situation of that district, can it be a matter of surprise that such should be the case, the imperfect drainage, the filth and poverty of the population, and the presence of a wide uncovered drain close to this part of the town, rendering it only to be wondered at that disease is not more virulent."

38. The comparative mortality of the A and E Divisions gives, however, no adequate idea of the *extreme* difference between the mortality of the drained and undrained districts of the island. The A Division, though it includes the Fort, the drainage of which is *entirely* covered, and which is consequently by far the healthiest sub-division of the island, contains also the Esplanade sub-division, which is rendered unhealthy by the bad smells of Back Bay, and the ill-conditioned sub-division of Colaba. On the other hand, the E Division contains the rural and consequently healthy sub-divisions of Parell and Sewree, as well as the undrained and unhealthy sub-divisions of *Cammatee Poora*. Were the annual death-rates of the Fort and *Cammatee Poora* sub-divisions alone contrasted, the difference would be far more striking.

39. Ever since the first census and mortality returns were taken in Bombay, I have analysed, compared, and tested them in all possible ways, and constructed, from the data they afforded, detailed tables regarding the ratio of mortality to population in each police *sub-district* of the island; but these tables are rendered comparatively valueless by the extreme inaccuracy of the census, which, under the manipulation to which I have subjected it, discloses discrepancies palpably incompatible with the truth. The *mortality returns*, indeed, may be trusted, except for infants, many of whom are buried in compounds, without their deaths being reported to the police; and I have reason to believe that the TOTAL of the population of Bombay is pretty correctly stated in the last census at 510,000. I have arrived at this conclusion by comparing the mortality returns of Bombay with those of London, and assuming that the general death-rate of the former will be to that of the latter in the same ratio which that of the Native troops of Bombay (which is accurately known) bears to that of the English troops in London.*

* The annual proportion of deaths to population in the various European States is as follows:—

In England, 21.73 per 1000; Denmark, 22.22 per 1000; Russia in Europe, 22.73 per 1000;

40. But though I have thus reason to believe that the *total* of the last census is not far from the truth, the details exhibit some palpable impossibilities. The Parsees, for instance, have evidently greatly exaggerated their numbers, probably more than doubled them. No doubt can attach to the correctness of the police returns of Parsee deaths, yet these are at the rate of only $7\frac{1}{2}$ per 1000 per annum on the *alleged* Parsee population, a death-rate far too low to be possible in any country in the world, being only about half the death-rate of the healthiest rural districts of the North of Europe.

41. In the last tables I framed of the death-rates of the different police sub-divisions of the island, I took the census of 1850-51 as the standard for population, because that census was the lowest, and the

Belgium, 23.81 per 1000; Norway and Sweden, 21.38 per 1000; Austria, Portugal, Spain, and Switzerland, 25.00 per 1000; Prussia, 25.64 per 1000; Turkey, 33.33 per 1000.

The difference in the general death-rate of these countries is principally due to the difference in the infant mortality of each. The death-rate of the adult male population, between 18 and 60, has a much narrower range, and does not depart materially from 10 per 1000 in any European State.

The mortality of the armies of Europe and the United States seems rather proportionate to the amount of work exacted from each, and to the class of men that compose it, than to the general death-rate of their respective States.

It is singular, however, that even in time of peace, and in the lightest worked and best cared for armies, the death-rate is considerably higher than that of the similarly aged civil population.

The Prussian army loses annually 11.7 per 1000; the similarly aged civil population of Berlin only 10 per 1000; British Army (average) 37 per 1000; ditto serving at home, 15 per 1000; ditto serving abroad, 57 per 1000; French army, 34.7 per 1000; ditto exclusive of officers, 46.5 per 1000; Russian army, 50 per 1000; ditto in Caucasus, 160 per 1000; United States army (average) 44 per 1000; ditto serving in Northern States, 18 per 1000; ditto in Southern States, 44 per 1000.

The low death-rate of the Prussian army can be accounted for: it is the best educated army in Europe; it is composed of young men only engaged three years in active service, and it suffers little from being removed from place to place. On the other hand, the army of the United States, which consists of only 5,515 men, doing duty in a territory nearly as large as Europe, is very much knocked about, and being, moreover, composed of Irish of the lower class, who take no sort of care of themselves, it loses four times as many per 1000 as the Prussian army. The extraordinary loss which has always been experienced by the Russian troops on field service is attributed to their defective commissariat arrangements.

One of the most singular circumstances connected with the vital statistics of European armies is that the infantry loses nearly twice as many men per 1000 as the cavalry: thus in the British army, from 1830 to 1836, the dragoons lost annually 14 per 1000, and the infantry 26.6 per 1000; the horse guards lost only 31.3 per 1000 during a period of time in which the foot guards lost 56 per 1000. The Piedmontese forces, on the average of more than 20 years, experienced a mortality of 18 per 1000 in the cavalry, and 34 per 1000 in the infantry.

In the Prussian army (the healthiest in the world) the infantry lose 12.9, the cavalry 9, and the artillery 10 per 1000 per annum.

I am not aware whether this difference between the death-rate of cavalry and infantry is found to obtain in India.

second one taken; but as we had a visitation of cholera that year, I took the death returns of 1849-50 as the standard of average mortality. In the tables framed on these data the death-rate of the Fort (the only district we have which is *altogether provided with covered drains*) is only 9.9 per 1000, while that of some of the sub-divisions of the Native Town is as high as 60 per 1000, or somewhat more than the death-rate of similar localities in Liverpool. Even assuming that the Parsees in the Fort had returned their number at twice its real amount, and that something more than a third must on that account be subtracted from the total alleged population of the Fort, the death-rate in that sub-division would still be under 14 per 1000, or *less than a quarter of the death-rate* of the unhealthiest of the undrained districts; and this is exactly the difference found to exist between the death-rates of the worst and best conditioned streets in English towns.

42. The greater portion of excessive mortality of ill-conditioned town districts is certainly due to many other causes besides the deficiency of covered drains; but the sanitary statistics of English towns show with sufficient exactness that a large and specific amount of such excess (20 per cent.) is attributable to this cause alone. I will adduce the authority of Mr. Holland's Report on the Sanitary Condition of Charlton-upon-Medlock regarding this point. Mr. Holland's results are fully confirmed by Mr. Gardener and Mr. Noble's reports on the sanitary condition and mortality returns of certain streets in Manchester before and subsequent to their drainage; but I have selected Mr. Holland's report as being the most careful and elaborate of those I can at present lay my hands on.

43. *Extracts from a Report on the Sanitary Condition of Charlton-upon-Medlock, by H. P. HOLLAND, Esq., extracted from the Report on the State of large Towns in Lancashire, by Dr. LYON PLAYFAIR.*

"In order to answer the question, 'What is the general condition of the district with respect to health?' upon sure grounds, I have undertaken a very laborious examination of the condition of every street and court of the district; and next, have ascertained the rate of mortality in each during the five years ending June 1843. I first obtained from the books of the assessors of the poor's rate the number of occupied and unoccupied houses in each street, and their rent; I next visited each street, and took notes *on the spot* of its condition as to paving, cleansing, sewerage, and free circulation of air, or otherwise; of the general condition of the dwellings with respect to cleanliness, dampness, or dryness, and supply of water; whether or not they had back doors, yards, privies, &c.; and remarked upon any other circumstances which

caught my attention as likely to influence the health of the inhabitants. These observations I compared with information kindly furnished by Mr. Langtry, the District Surveyor, and other public officers, as well as from the inhabitants themselves, and from the result classified the streets into nine such divisions: first, into three divisions as respects the streets themselves—the best, intermediate, and worst-conditioned classes; next each of these into three sub-divisions, according as the houses were of the first, second, or worst class.

44. “The first class of streets includes those of the town part of Charlton-upon-Medlock, which are completely paved and sewered, regularly cleaned, are thoroughfares, and wide enough to admit of a free circulation of air.

“The second or intermediate class are such as are unpaved and imperfectly drained, but still kept clean and tolerably dry, as well as such as, though paved, are too narrow and confined to admit of a free circulation of air.

“The third class are those which are not paved, not sewered, not cleaned, and not well ventilated, and are often little better than courts.

45. “The sub-divisions are made according to the houses—

“The first class of which are those of ample size, provided with yards, lobbies, and kitchens, are well supplied with water, and which have nothing about them attracting notice as likely to be injurious to health.

“The second class includes the better sort of cottages, those that have back doors, and those larger houses which, being closed behind, or on damp soil, or badly supplied with water, cannot be considered quite unobjectionable.

“The third class includes those streets where the majority of the dwellings are without back doors, without yards and privies, without a proper supply of water, or have some other very evident defect.

46. “I next undertook an analysis of the deaths registered as occurring in the district during the five years ending June 30th, 1843, and ascertained how many deaths have occurred in each of the streets during that period.

47. “In order to avoid the possibility of unconsciously warping the result, I completed the classification of the streets *before* I knew what were their rate of mortality. The two inquiries were completed separately, and the results compared afterwards. Many of the streets have been paved and sewered during the five years; these have been placed in two classes; in the class in which they were before their improvement during the time they remained unimproved, and in the class to which they now belong during the years subsequent to their improvement.

48. “The following tables exhibit the rate of annual mortality in

the different classes of streets and houses of the town part of Charlton-upon-Medlock, in the average of the five years ending June 1843:—

“TABLE A,

Exhibiting the Rate of Mortality in different Classes of STREETS, the Houses being of all Rates.

Classes of Streets.	Rate of Mortality.	Excess per Cent. above First Class Streets.
Streets of 1st Class. . .	2·2 per cent. or 1 in 46	..
„ 2nd Class. . .	2·6 „ „ 1 in 39	18
„ 3rd Class. . .	3·7 „ „ 1 in 27	68

“TABLE B,

Exhibiting the Rate of Mortality among the Inhabitants of different Classes of HOUSES, the Streets being of all Classes.

Classes of Houses.	Rate of Mortality.	Excess per Cent. above First Class Streets.
Houses of 1st Class. . .	1·9 per cent. or 1 in 52	....
„ 2nd Class. . .	2·5 „ „ 1 in 40	About 31
„ 3rd Class . .	3·1 „ „ 1 in 29	„ 78

49. “From comparison of these tables, it would appear that the rate of mortality is more influenced by the class of houses inhabited than by the condition of the street; for we find that the mortality in the first, second, and third classes of streets, the houses being of all classes, has been in the proportion of 100, 118, and 168; but in the houses of the first, second, and third classes, the streets being of all classes, that the proportion of mortality has been 100, 131, and 178; there is, therefore, a greater difference in the rate of mortality among inhabitants of different classes of houses than in those of streets of different condition. When, however, the evil influences of both badly constructed dwellings and badly conditioned streets operate together, the destructive effect is very striking. For instance, the third class houses of the first, second, and third class streets are nearly alike in construction, are about the same size, are charged about the same rent, and are inhabited by about the same class of persons; but the rate of mortality in the third class houses in the first and second class streets has been 2·7 and 2·8 per cent. respectively, while in those of the same class of houses, but in the third class streets, the rate has been 4 per cent., or a higher rate of mortality, in the proportion of 10 to 7. *I am aware of no circumstances but those*

connected with the bad condition of the streets which will account for this great difference.

50. "It may be thought that these streets are inhabited by a poorer class than the others, but I do not believe that is the fact, except so far as their poverty is increased by the expenses of sickness and death in their families, and by consequent loss of work. Their incomes *while at work* must be much the same, for they have the same sorts of employment. *There seems every reason to hope, that if these worst streets were put into good condition, the rate of mortality would fall 25 per cent. or more. The diminution in the rate of mortality has been nearly 20 per cent. in the streets which have been improved as before stated: it has fallen from 3.1 per cent. or 1 in 32, to 2.53 per cent. or 1 in 39. The effect of a permanent good condition, as we have just seen, appears to be still more beneficial; and there can be no doubt that if the houses, as well as the streets, were put into proper condition, the rate of mortality would fall still more. It is, indeed, unreasonable to expect that the general state of health and longevity of the poor can be raised as high as that of those in more comfortable circumstances, by any, even the best, sanitary arrangements; but I think the evidence here adduced distinctly shows that the rate of mortality among the poor certainly, among all classes probably, is unnaturally high, from the operation of removeable causes of disease.*

51. "When we find the rate of mortality four times as high in some streets as in others, and twice as high in whole classes of streets as in other classes, and, further, find that it is all but *invariably high in those streets which are in bad condition, and almost as invariably low in those whose condition is good, we cannot resist the conclusion, that multitudes of our fellow creatures, hundreds of our immediate neighbours, are annually destroyed for want of the most evident precautions.*"

52. All undrained streets are not in an equally bad condition. *The amount per cent. by which the death-rate of a street would be reduced by draining it depends of course on whether the former state of such street was rather bad only, or very bad indeed; it also depends on the density of population, as over-crowding is found very much to increase the ill consequences attendant on the want of drainage. I shall now therefore show—1st, that open drains, or rather receptacles for filth, abound in the Native Town of Bombay to an extent I believe to be unparalleled elsewhere; and 2nd, that in most divisions of the Native Town our population is over-crowded beyond all English precedent; and for these two reasons, I think, we may confidently expect that in Bombay the drainage of undrained streets will be attended by a much larger reduction in the death-rate than has been found to result from similar improvements in England.*

53. The open drains, or rather uncovered receptacles of filth that I have alluded to, are the open side gutters, by which nearly every street in the Native Town is polluted. These do not deserve the name of drains: there is seldom any perceptible motion in the liquid contents of the majority of them; they are merely an interval of from one to two feet in width, left between the kerbstones of the streets and the foundations of houses; they are not regularly sloped, but follow the inclination of the several streets; they are not paved at the bottom, and the scavenger's people, in cleaning out with their shovels any solid matter that may have been thrown into them, constantly stir and scrape up the mud beneath, so as still further to increase the irregularities of their channels, and render them still more unfit for the performance of the functions of a drain. These side gutters can, therefore, only be considered in the light of continuous open cesspools, extending along (on both sides) the whole length of nearly every street in the Native Town, and rendered (irrespective of their greater extent) more objectionable than ordinary cesspools, by the circumstance of their being in actual contact with, and soaking into the foundations of, the whole street-frontage of each house.*

* It will be remembered that four years ago the *Girgaum* and *Kalbadavee* roads, the two principal thoroughfares of the Native Town, and those most frequented by Europeans, were still polluted by these open side gutters; and though covered drains have since been substituted in these two particular streets, such improvement has, owing to the deficiency of funds, made very little progress in the back streets of the Native Town.

N. B.—This note was written in 1852, (date of report 31st March 1852,) and I am happy to state that the open side gutters therein complained of have since almost entirely disappeared.

This improvement is due to the increased rate of progress in drainage that has been brought about by the adoption (as far as local circumstances permitted) in 1852 of the improved system of drainage elaborated by the experiments of the English Board of Health and the Sanitary Commission, and described in the "Minutes of Information on Town Drainage" that were published in the preceding year. The effect of these improvements has been to diminish the cost of street drainage in Bombay to one-half its former amount, and the diminution of cost is accompanied by a great increase in efficiency, owing to the improved scour in the sewers, due to their smaller size, their improved cross-section, and their more direct course.

In the season of 1852-53, 87 streets and roads were thoroughly drained on the new system, and the drainage of the Old Town thereby completed. During the next season the two blocks of the New Town, situated between Bhenly Bazar Road, Duncan Road, Erskine Road, and Bellasis Junction Road, containing 29 streets, were thoroughly drained: and in addition to these, the suburb of Small Colaba, and five other streets in different parts of the town, were drained during the same season. I have prepared and sent in detailed estimates and plans for the drainage during the present season of the Sonapoor District (containing 14 streets), of Commattee Poora (containing 18 streets), of Khetwaddy (containing nearly 20 streets), and the remaining portion of the New Town situated between Duncan Road, Trim-buck Furnusram Street, Coombarwada, and Grant Road, and containing 13 streets. The construction of all these has been sanctioned by Government, but their execution has been delayed by a deficiency in the municipal revenue, occasioned by the discovery of a flaw in the Act for collecting the shop and stall tax. When the improvements already sanctioned are

54. The evils arising from cesspools or open receptacles of filth of even ordinary extent and position is thus stated in the First Report of Her Majesty's Commissioners for inquiring into the state of large Towns and Districts (Vol. I. page 17):—"The medical witnesses have brought before us facts in support of their strongly urged and unanimous opinion, that *no population can be healthy which live amid cesspools, or upon a soil permeated by decomposing animal or vegetable refuse, giving off impurities to the air in their houses and in the streets.*" In their Second Report they add (Vol. I. page 111):—"Many instances occur, where the walls of the adjoining houses are *constantly wet with fetid fluid, which frequently affects the atmosphere of the rooms so as to render it impossible to keep food for one single night without its becoming tainted. The walls of the house receive considerable damage, and the foundations are completely saturated with the foul water that percolates through from the cesspools. The deterioration of property from this cause is very considerable.*"

It is also stated in evidence, that the springs and wells are constantly polluted by the same cause. "As houses are built, and *neighbourhoods become more crowded,*" says Mr. Joseph Quick, (First Report, Vol. II. page 117,) "the pollution of the springs by the permeation of water from cesspools becomes greater."

55. I have already said that the energy with which the miasma arising from uncovered drains acts on the inhabitants of town districts is always found to be proportionate to the density of the population: an open drain which would not augment the death-rate of a thinly inhabited district by 3 per cent. is often found to increase that of an over-crowded neighbourhood by upwards of 20 per cent. Thus, in one of the reports of the Registrar General, the districts of the Metropolis are divided into three groups, of ten districts each, under the titles of the *healthiest*, *medium*, and the *unhealthiest* districts.*

completed, the drainage of the town will be so also, with the exception of the Oart District, a district which has become irregularly and very densely covered with houses, without ever having been laid out into streets, or intended for a town; the whole, therefore, form a labyrinth of very crooked, irregular, narrow, and filthy alleys; and an Act of legislature for obtaining the ground required for streets in this district must be obtained before anything can be attempted towards its drainage.

* I have extracted this table from the chapter on the causes of high mortality in town districts, commencing at page 406 of the Fifth Annual Report of the Registrar General. The whole of this chapter is very curious. From the vital statistics of certain districts of the Metropolis, the general laws are deduced (and expressed in algebraical formulæ), which regulate the action of these various causes on the rate of mortality. These formulæ are then tested, by comparing the results, as calculated by the formulæ for other districts with the actual results of direct observations in the same districts; and the coincidence of the calculated results, and result of direct observation, is very remarkable. For instance, the Registrar General says: "In endeavouring to estimate the effects of density of population in districts, I shall, to

56. The ten *healthiest* districts, with an allowance of 202 square yards of space to each person, have a mortality of 20·4 in 1000.

The ten *medium* districts, with about half the space, viz. 102 square yards, lose 24·4 in 1000.

While the ten *unhealthiest*, with the allowance of 32 square yards to each inhabitant, have a mortality of 27·8 per 1000.

simplify the inquiry, take examples from the observations on females. [The female mortality of an English town district is considered a surer criterion of its sanitary state than that of the males, because the latter class, owing to the nature of their daily avocations, are generally absent from the districts, in which their families reside for the greater portion of the 24 hours.]

“ I take three from the class of districts in which the mortality is highest—Whitechapel, Shoreditch, and Bethnal-Green. They are inhabited by very much the same class of people ; the sewerage and supply of water is nearly the same ; the value of assessed property is greatest in Whitechapel, less in Shoreditch, least in Bethnal-Green ; but the density is different, and the mortality is highest in the densest districts. Until the expectations of life have been calculated, the mortality may be employed.

Districts.	Annual Mortality of Females. (<i>m</i>)	Population to a Square Mile. (<i>d</i>)
Whitechapel.....	·02978	127,313
Shoreditch.....	·02790	86,123
Bethnal-Green.....	·02617	62,390

The mortality was for the four years 1838 to 1841. The mortality of males, and several other facts, are given in tables, pp. 448, 449.

It will be observed that the density of population is half as great again, and the mortality one-fifteenth part higher in Whitechapel than in Shoreditch ; so that the mortality does not increase in the same ratio as the density ; and representing the density of the densest district (Whitechapel) by d' , that of the least dense (Shoreditch) by d ; the mortality of the densest district (Whitechapel) by m' , that of Shoreditch by m , the proportion does not hold :—

$$m' : m :: d' : d$$

Upon reducing the terms to the form of an equation, it will be seen that the mortality increased as the sixth roots of the densities ; for

$$\frac{m'}{m} = \sqrt[6]{\frac{d'}{d}} ; \text{ and consequently } m' : m :: \sqrt[6]{d'} : \sqrt[6]{d}$$

We have then the formula $m' = \sqrt[6]{\frac{d'}{d}} m$, which is the mortality of Whitechapel, expressed in terms of the mortality of Shoreditch, and the densities of Shoreditch and Whitechapel. By substituting the number expressing the mortality of Whitechapel, and the densities of

Whitechapel and Bethnal-Green in the formula, the equation is $\sqrt[6]{\frac{62,390}{127,313}} \times \cdot 02978 = \cdot 0264$ for the mortality of Bethnal-Green, the mortality given by direct observation having been ·0262.

He then applies the formulæ to other districts, and the same coincidence between calculated and actual results obtains throughout. He concludes his remarks on *this particular cause of high mortality* as follows :—“ In a complicated question of this kind it would be premature

57. In the table below, I have given in juxtaposition to the above the names of the six police sub-divisions which constitute the Native Town of Bombay, with the number of square yards per individual inhabitant in each. From this table it will be seen, that the density of population in the most thinly inhabited of these sub-divisions is more than double that of the most thickly inhabited districts of London, and that the density of population in three of the six sub-divisions of Bombay is about four times that of the most over-crowded districts of the English Metropolis, and that the mean density of population in these districts is thirteen times that of London.

58. Poverty being also a predisposing cause to the class of diseases prevalent in ill-conditioned town districts, it will be instructive to compare the ratio of annual rental to population in London and Bombay, allowance, of course, being made for the difference of climate, and cost of living in each instance. I have, therefore, included in the table the average annual rental per head in London and Bombay respectively.

59.	In London.		In the Native Town, Bombay.	
		Sq. Yds. per each Person.		Sq. Yds. per each Person.
Density of population.....	In 10 healthiest districts.....	202	[Khara Tulao ..	20 $\frac{1}{2}$
Average square yards of space to each person.....	In 10 medium do ..	102	[Market.....	16
	In 10 unhealthiest do.....	32	[Bhooleshwur ..	10 $\frac{1}{2}$
			[Mandavee ..	8 $\frac{1}{2}$
			[Oonerkharee ..	8 $\frac{1}{2}$
			[Dhobee Tulao ..	8

Average annual rental to each person, in London Rs. 61 ; in Bombay Rs. 6-9-5 ; or nearly ten times greater in London than in Bombay.

The population of London was in 1841* 1,873,676, occupying 44,850 acres, on an average 115 square yards each. The population of the six to assume that the mortality of towns always increases *ceteris paribus* in the ratio of the sixth roots of the densities, but the formula may now be employed as an approximation in sanitary inquiries." The whole chapter is curious, as exhibiting many instances of the application of algebraic formulæ to matters which few would have thought susceptible of such a mode of illustration.

* In 1850, the actual assessed rental of the districts subject to the jurisdiction of the consolidated Metropolitan Commission of Sewers (such jurisdiction including, with the exception of the city district, containing a population of 130,000, the whole of London and its suburbs) was £12,186,000, and the population of such districts was estimated at 2,000,000 : this would make the average rental per head £6 1s. 10d. or Rs. 61, or nearly ten times the average rental per head of Bombay. I have, however, reason to believe that house property in Bombay is generally assessed considerably under its actual value. I know this to have been the case in nearly all the instances that have come under my own observation in purchasing property for public purposes. The rental per head of the city district of the English Metropolis would certainly exceed the average of the other metropolitan districts.

urban sub-divisions of the Native Town of Bombay is 337,169, occupying 6,659 acres, or 9·5 square yards each, or only about one-thirteenth of the English average.

[N. B.—I have excluded the Girgaum sub-division from the calculation, as being principally a rural district ; the density of its population (111·5 square yards per head) being little more than one-tenth of the mean density of the six above-mentioned districts.]

60. I think that the statement I have made regarding the present over-crowded and ill-conditioned state of the Bombay streets requiring drainage, and the examples I have adduced of the remarkable reduction of annual mortality always attendant on the drainage of streets in English towns not nearly so ill-conditioned or over-crowded as those of Bombay, together with the extraordinary salubrity (as compared with our other districts) of the Fort, the only completely drained town sub-division in the island, afford sufficient grounds to establish the position I advanced at the beginning of my Report, that the drainage of a street hitherto undrained has the immediate effect of reducing its annual mortality by *at least* 20 per cent.

61. I have given greater space than I otherwise should to the exposition of the sanitary reasons for pushing on the sewerage of the town as rapidly as possible, because the importance of sanitary improvements of this nature is not as yet duly recognized in Bombay. At the last meeting of the Bench, it was observed (and I had heard the same remarks in other quarters), “that the alienation to police purposes of about one-third of our present expenditure on municipal improvements would *only* diminish the number of streets drained per annum.” In fact, the general impression seems to be, that a defective police is a greater municipal evil than a defective sanitary condition : but this position is altogether untenable, for the only object of a police is the protection of life and property ; and admitting that in the last thirty years some half dozen lives and a few thousand pounds’ worth of property may have been lost through the insufficiency of the Bombay police to meet an emergency such as was caused by the late disturbances,* what is this to the thousands of lives which it can be proved are annually lost in Bombay “*for want of the most evident sanitary precautions ?*”

62. The apathy that prevails regarding the amount of life lost through defective sanitary arrangements is extraordinary. When attention began to be paid to these subjects in England, the public were startled by the assurance that a greater number of lives were lost every year through preventable causes of disease than the Allies lost at the battle

* There was only one life lost in the late riots, and not one was lost in the dog riots thirty years ago ; and there have been no disturbances in the interim.

of Waterloo ; yet years passed before any efficient means of prevention were actually adopted. The loss of property, too, attendant on a high rate of mortality, is seldom thought of—a high annual rate of mortality is even considered by some as a wholesome check on population : but it must be remembered that a high rate of mortality can only be occasioned by premature death ; that for every death occasioned by preventable causes there are, according to the best English medical authorities, at least fourteen cases of illness, more or less protracted, during which the patient is not only unproductive himself, but is a burden to the productive labour of others, and that, in fact, premature deaths presuppose unhealthy and unproductive lives.

63. I will not lengthen this Report, already too long, by quoting evidence from blue books, as I could do, to show that *sanitary reform is in itself a police improvement* ; and that crime, dirt, and a high rate of mortality, are generally found to be co-extensive.* I think enough has

* “The immoral influence of filth and discomfort,” says Dr. Southwood Smith, “has never been sufficiently attended to.” “It is remarkable,” says the same authority in another report, “that the districts of which we have been speaking are not only the seats of disease, but the great seats of crime—I mean these places are the haunts and abodes of the great criminals ; so that the localities of the most terrible diseases, and the abodes of the great criminals of the country, are identical. The worst place I know, in the parish of Whitechapel, is the place where the most dishonest and profligate portion of the population live.”

Captain Miller, the Superintendent of Police in Glasgow, in a report on the state of crime in that city, says :—“It is of great moment, as affecting the state of crime, that the health of the lower classes of the community be strictly attended to. In the very centre of the city, there is an accumulated mass of squalid wretchedness which probably is unequalled in any other town in the British dominions. These places are filled by a population of many thousands of miserable creatures. The houses in which they live are unfit even for sties, and every apartment is filled with a promiscuous crowd of men, women, and children, all in the most revolting state of filth and squalor. In many of the houses there is scarcely any ventilation ; dunghills lie in the vicinity of the dwellings ; and from the extremely defective sewerage, filth of every kind constantly accumulates. In these horrid dens the most abandoned characters of the city are collected, and from thence they nightly issue to disseminate disease, and pour upon the town every species of crime and abomination.

“In such receptacles, so long as they are permitted to remain, crime of every sort may be expected to abound, and unless the evil is speedily and vigorously checked, it must of necessity increase. The people who dwell in these quarters of the city are sunk to the lowest possible state of personal degradation, in whom no elevated idea can be expected to arise, and who regard themselves, from the hopelessness of their condition, as doomed to a life of wretchedness and crime. Much might be done to relieve the misery, and to repress the crime of this destitute population, by compelling attention to personal cleanliness (so as to remove and prevent disease), and, by opening up and widening the thoroughfares, and forming new streets wherever practicable, by causing the houses to be properly ventilated, and all external nuisances removed, and by an improved plan of sewerage for carrying away all impurities. Where it is possible to adopt measures something similar to these, the health of the community would be greatly improved, and by the breaking up of the haunts of vagrancy, a happy check would be given to the spread of profligacy and crime.”

“I have not the slightest hesitation,” says Mr. Davies, speaking from ten years’ experi-

been already said to show that the alienation, even for a single year, of Rs. 20,000 or Rs. 30,000, which might otherwise be spent in sanitary improvements, would occasion annually a preventable loss of life and productive labour greater than that occasioned by the riots and disturbances of the last thirty years.

64. I shall now proceed to consider the state of the Municipal Fund, with reference to the demands upon it, on account of works urgently and immediately required.

65. With the object of showing this plainly, I have compiled the tables given in the Appendices A, B, C, D, E, F, and G. It will be seen

APPENDIX A.

Details of the Income of the Board of Conservancy, from all Sources, for each year, from 1845-46 to 1850-51, both inclusive; showing also each year's Total Expenditure, and the state of the Board's Account with Government at the close of each.

APPENDIX B.

Particulars of the Board's General Expenditure for each year, from 1845-46 to 1852-53, both inclusive.

APPENDIX C.

Particulars of the Board's Executive Expenditure, for the same period.

APPENDIX D.

Particulars of the Board's Establishment, for the same period.

APPENDIX E.

Particulars regarding the Contracts for the Repairs and Scavenging of 130 Miles of Road for the same period.

(from the margin) that these embrace all particulars of importance relating to the income, expenditure, and working system of the Board, and its executive establishment, since 1845-46. Each Appendix is accompanied by explanatory remarks, which will, I trust, render it perfectly intelligible to all. The remaining Appendices, H, I, J, and K, relate to the cleansing and drainage of the town, to its water supply, its roads, its census returns, and to the system of its municipal establishments, as compared with the system now usually adopted in large English towns.*

ence of the poorer classes, "*in AFFIRMING that there is a most decided direct connection betwixt confined districts, bad sanitary arrangements, and poverty and vice.* In the districts above referred to, the moral state of the inhabitants is most deplorable. As the youth from these places grow to manhood, they become habitual paupers, brought up to no regular employment, grossly ignorant, and reckless how their time is spent between the union work-house and the jail.

"In conclusion, I can only say, that *if the Government wish to prevent the increase of a most debased and vicious population, they will take measures, if not to sweep away these nests of vice and disease already built, at any rate to prevent similar places from being erected in future.*"

The evidence of Sir Charles Shaw, Chief Commissioner of Police at Manchester, is to the same effect.

* I trust that this Report and its Appendices will supply what I have long felt to be a desideratum to those connected with, or interested in, the sanitary economy and municipal arrangements of Bombay. A great sanitary movement has taken place in England during the last ten years, and its most prominent results have been a complete revolution—1st, in the legislative enactments regarding the municipal and sanitary economy of towns; 2nd, in the machinery of boards and establishments for carrying out sanitary objects; and 3rd, in the constructional details of sanitary engineering. None of these various improvements have as yet extended to Bombay, and though all are aware that much reform has taken place in England,

APPENDIX F.

A List of the New Works executed, at the cost of the Municipal Fund, since the institution of the Board of Conservancy; with the mode in which such Works are let to Contract, and the Rates at which they have been executed.

APPENDIX G.

Rough Estimate of the probable Cost of certain Public Improvements, urgently and immediately required for the Improvement of the Island.

APPENDIX II.

A Comparison between the different Modes of Conveying away and ultimately disposing of Night-soil adopted in London, Paris, and Bombay; with Suggestions for obviating the Nuisance arising from the present defective state of the Board of Conservancy's arrangements for the purpose; together with Suggestions for the proper Regulation of the Bombay Burial Grounds.

APPENDIX I.

On the Amount of the existing Water Supply of Bombay, with reference to the Population; and on the various Methods which have been proposed for increasing the Supply, both from Sources within the Island and from Salsette.*

APPENDIX J.

On the System of Sewers already laid down for the Drainage of the Native Town; and on the improved System of Town Drainage recently introduced in England, and its applicability to Bombay.

APPENDIX K.

On the Practicability of Lighting Bombay with Gas.

am about to write to England for official returns regarding the income and expenditure of the principal English towns, and I will communicate to the Board the information I receive on the subject; but the extreme inadequacy of our income to the wants of so large a population will appear evident from the figures given in the notes of my tables regarding certain

few out here have any knowledge of the practical details of such improvements, or have considered the advantage of adopting them as far as practicable in this island:

In this Report and its Appendices I have considered each of the principal subjects relating to the sanitary economy of a large town separately, and in treating of each of them, I have described—*1st*, the past and present condition of Bombay, with reference to the particular subject under consideration; *2nd*, I have given the details of the most recent and improved arrangements adopted in English towns with reference to the same subject; and *3rd*, I have pointed out in detail the extent to which the English plans might with advantage be adopted in Bombay.

* This has been already published in the "Selections from Government Records," No. I.

66. In the notes appended to Appendices B, C, D, E, and F, I have given comparative statements regarding the executive expenditure of the Board of Conservancy, and that of the Road and Tank Department, and also regarding the municipal statistics of Bombay, as compared with those of certain English towns.

67. From these statements it appears, that as respects population, the average number of square yards of space to each person is in London 115·83, and in the six sub-divisions of the Native Town of Bombay, taken together, 9·56, and that our population is therefore nearly thirteen times as over-crowded as that of London; and that in London the mean annual value of rated property to each person is ten times as great as it is in Bombay.

68. The municipal revenue of Bombay is very much lower in proportion than that of any other town I am acquainted with where sanitary reforms have been attempted. There are towns in England (Plymouth for example) having a larger actual revenue, with only one-tenth of our population. I

items in the municipal statistics of Liverpool and other English towns: Liverpool, for example, with a population of 369,000, contains 174 miles of made carriage way. Were our roads in the same ratio to our population, we should have 244.7 miles; we actually have only 130. The average cost of the repairs and maintenance of our 130 miles of road is Rs. 75,403-9-8 per annum. At the Liverpool rate of cost of repairs of macadamized roads per mile, it would be Rs. 8,29,439-10-4 (nearly eight lakhs and thirty thousand), and if we had the Liverpool proportion of roads to our population, this item would in Bombay be Rs. 17,81,856-10-8, or nearly eighteen lakhs per annum.*

* The rate I have given (a penny per yard per annum) as the average cost of the repair of the Bombay roads, includes also the cost of watering, whereas the London and Liverpool rates are exclusive of watering. In Dempsey's Rudimentary Treatise on the Drainage and Sewerage of Towns and Buildings, page 118, the cost of watering is stated as follows:—"It has been ascertained in London, that one ton of water, or 252 gallons, is sufficient to lay the dust over a surface of 600 square yards of gravel or macadamized roads, or of 400 square yards of granite paved streets. The average number of days per annum in which it is found, from 20 years' experience, to be necessary to apply water for this purpose, is about 120. The common charge for this work is at the rate of $\frac{1}{4}$ d. per square yard for the season, the water being applied only once per diem, or £50 per mile of a main road. The common assessment per house for watering roads twice a day is £1 for the season." The number of houses in London is between 280,000 and 300,000, but many of the back streets are seldom watered.

I have compiled the following table from the answers of the various Water Companies of London to the queries of the Board of Health on the subject:—

Water Companies.	Quantity of Water used daily in watering (morning and evening) each Mile of Street 30 feet wide.	Ditto Season of 120 Days.	Cost of Watering one Mile per Day.	Ditto Season of 120 Days.
	Gallons.	Gallons.	Rupees.	Rupees.
New River Company	8,774	1,052,880	5	600
East London Water Company.....	10,476	1,257,120	6	750
Southwark and Vauxhall Water Company	No return.	....	From 4 to 5	From 500 to 600
West Middlesex Water Company	Ditto.	....	6	750
Lambeth Water Company.	16,000	1,920,000	3	360
Chelsea Water Company..	From 15,000 to 20,000	{ From 1,800,000 } to 2,400,000 }	From 4 to 6	From 500 to 750
Grand Junction Water Company	14,000	1,680,000	6	750
Hampstead Water Company	8,000	1,036,800	5	600

Of the 130 miles of macadamized roads within this island, the larger proportion are never watered at all. None are watered on Sundays. 32 miles, 6 furlongs, and 139 yards are watered six times a week; 2 miles and 173 yards are watered four times a week; 18 miles, 5 furlongs, and 129 yards are watered three times a week; and 5 miles, 5 furlongs, and 146 yards are watered twice a week; making a total of 272 miles, 7 furlongs, and 5 yards of double watering effected during each working week of 6 days: this is equivalent to 45 miles, 3 furlongs, and 184 yards (about one-third of our total road mileage) of double watering effected daily.

I have shown that the London rate for road-watering is from Rs. 500 to 700 per mile per season of 120 days. The length of the Bombay season for road-watering is (exclusive of

69. The assumption that, on an average, each town inhabitant makes an equal amount of litter, would lead to the conclusion that the amount of scavengering required in different towns should be in direct ratio to their respective population; yet the scavengering of Liverpool, with a population of 369,000, and a street surface mostly paved, and non-absorbent, costs Rs. 1,00,021 per annum.* Were the cost of scavengering the town of Bombay in the same ratio to our population, it would be Rs. 1,40,679 per annum, whereas the actual average cost is only Rs. 34,870 per annum.

70. In Liverpool, with a population of 369,000, more than 17 miles of new sewerage were completed last year: were our sanitary improvements pushed on in the same ratio to our population, we should construct 24 miles of sewers per annum. Our actual rate of progress has been hitherto less than 2 miles per annum, on the average, and our maximum less than $3\frac{1}{2}$ miles per annum.†

Sundays) 217 days: this would make the cost of watering a mile (at the London rate per day) from Rs. 904 to 1,265 per season of 217 days; and at these rates the cost of the small mileage of road-watering done at Bombay would be from Rs. 41,121 to Rs. 57,569. The actual cost is Rs. 33,248 per season. The cost at the London rate per day of watering the whole of our 130 miles of road twice daily for 217 days in the year would be from Rs. 1,17,541 to Rs. 1,64,558 per annum. The quantity of water required to keep the dust laid per each mile of road is of course greater in India than in England.

* Report to the Health Committee of the Borough of Liverpool by the Borough Engineer, Inspector of Nuisances, and Medical Officer of Health, Liverpool, 1851.

† The flow of liquid in the sewers for each individual of the population is extraordinarily small at Bombay.

The recent paving of the channel of the main town drain afforded an opportunity for experimenting on the quantity of liquid that flowed along it. A dam of clay had been fixed across the channel to keep the sewerage water from annoying the workmen employed on the lower portion; such dam being periodically removed, to allow of the escape of the sewerage that had accumulated behind it.

Immediately below this dam I had two brick tankees constructed side by side, the capacity of each being 448 gallons. A bifurcated dammed wooden gutter was laid from the level of the sewerage accumulated behind the dam to each of these tankees, arrangements being made for instantaneously diverting the flow of the sewerage from one tankee to the other at pleasure. A large leather hose communicated with the bottom of each tankee, its orifice being hooked up while the tankee was filling, and let down for the purpose of emptying it.

The sewerage water was allowed to run through the forked wooden channel into these tanks alternately: the instant the first was filled the current was diverted into the second, and long before the second was full the first was emptied, and ready for filling again.

By this apparatus, the quantity of liquid running through the drain was twice measured, each time for twenty-four hours continuously, and the experiment gave a result of under 9,000,000 gallons of sewerage per annum for a population of 220,000. This is only about one-fifth of the average proportion of sewerage to population in England, as given by Smith of Deanston, and other standard authorities, as the result of direct experiment in English towns.

One principal reason for so great a difference is that in England it rains almost daily, while at Bombay not a drop of rain falls during the eight months of the dry season. In England, moreover, the circumstance of the sewers being lined with cement prevents leakage; and even

71. The most correct idea of the deficiency of drains at Bombay will be conveyed by comparing the ratio of sewer mileage to population in Bombay, exclusive of the Fort and other towns.

72. London, with a population of 1,873,000, contains upwards of 700 miles of sewerage (see Weale's London, page 829); Bombay, inclusive of the Fort, contains a population of 442,031, and less than 14 miles of sewerage. It will be remembered that this is less than the amount (17 miles) constructed in a single year in the town of Liverpool, with a population of 369,000 only.

73. We could never hope in Bombay for so large a municipal income, in proportion to our population, as that of the Metropolis. The amount of the latter may, however, be stated here.

74. In London, street improvements, and those of a sanitary nature, are paid for from different sources, and executed by distinct departments, having no connection with each other. The sewerage of the Metropolis is maintained and extended by means of a sewerage rate, limited to 5 per cent. (or one shilling in the pound) on the rental; and in 1850, the actual assessed net rental of the district subject to the jurisdiction of the Metropolitan Commission of Sewers (from which jurisdiction the "city" is exempted) was £12,186,000. 5 per cent. on this would be nearly Rs. 61,00,000 a year, but 5 per cent. is the limit, and the amount of the *general sewerage rate* actually levied is always greatly within it. In addition to the general rate, the Commission is empowered, "according to its judgment," to provide for the cost of any particular improvement by a "special rate" on the properties immediately benefitted thereby, the amount and mode of levying which they fix without appeal. They are also empowered to levy "an improvement rate," which is fixed at a maximum of 10 per cent. on the rack rent, in respect of works they may judge to be of private benefit. If, with reference to the rate

were they not so lined, the fact of the drains being generally laid at a depth of from 12 to 20 feet below the surface of the street, and being therefore in contact with soil surcharged with moisture, and consequently non-absorbent, would in great measure prevent the escape of the sewerage.

In Bombay, on the other hand, the sewers are not water-tight, and are all laid close to the surface, in soil which, owing to the dryness of the climate, sucks up every drop of moisture within reach of it. Another reason of the scantiness of the sewerage is the scanty consumption of water, and the absence of house-drainage, whereby the household slops and waste water of the population could be conveyed to the sewers, instead of being, as at present, thrown out on the thirsty soil, and there absorbed or evaporated.

For the above reasons, it is evident that the contents of the Bombay sewers must contain a much larger proportion of solid matter than is the case in England. Had the sewers of Bombay been originally constructed of a section proportionate to the actual amount of sewerage water flowing through them, the nuisance now occasioned by the annual removal of the large amount of sediment which collects in their channel would have been avoided.—(See Appendix J, on the drainage of Bombay.)

of assessment at Bombay, it be remarked that, in London, 5 per cent. was the *limit*, and that the rate *actually levied* was always considerably within that limit, it must at the same time be remembered, that the mean annual rental per head is in London ten times as high as it is in Bombay; that landlords at Bombay have no other rate at all to pay out of their rental, but that proprietors in London have to pay in addition heavy police-rates and poor-rates, the latter alone amounting on an average to an additional 8 per cent. per annum on the rental.*

75. Street improvements in London are, for the most part, paid for by a duty of 13*d.* per ton, on the 3,000,000 tons of coal annually brought within 20 miles of London. This yields an income of Rs. 16,25,000 per annum; and from the annexed extract from a paragraph on the subject, which has recently gone the round of the London papers, and been extracted in the *Home News*, &c., it appears that, of the nearly four crores last raised from these duties, by far the greater proportion was spent in improvements within the city district of the Metropolis, a district containing a population of only 129,729.

76. "*Coal Duties.*—Of the £3,738,067 raised by duties on all coal brought within 20 miles of London, the whole has been spent on improvements executed within a mile and a half of the General Post Office, excepting only the New Victoria Street, just laid down, and about to be built from Westminster Abbey to Pimlico. With this solitary exception, every farthing of duty paid upon the coal burnt in all Middlesex, and in a great part of Essex, Surrey, and Kent, has been spent in a small circle of a mile and a half radius. But the greater part of the sum has been spent within much narrower limits; that is, on the city and its immediate approaches. In the report, the amounts assigned to the three heads abovementioned are, £1,117,345 within the city, £807,500 without the city, and £1,813,221 of a general character; but the city has had the lion's share in the last expenditure, not only in having the actual disposal of the money, but in being itself the locality of the improvements."

77. The defective state of our municipal regulations prevents the amount annually spent in Bombay on sanitary improvement from going as far as it otherwise would. The expense of draining a street is two-fold—there is the large sewer along the centre of the street, and the small cross-drains at an average distance of 20 feet from each

* By the new Act at Calcutta, the assessment is limited to 6½ per cent. on the *gross* annual rental, and the Calcutta Bench have lately fixed the amount to be levied at 6½ per cent. In Bombay the rate is levied on the *net* instead of on the *gross* rental (10 per cent. being first deducted from the latter on account of repairs). A rate of 6½ per cent., levied on the Calcutta system, would therefore amount to within an anna of a rate of Rs. 7 per cent. levied according to our system.

other, to the houses on each side. In English towns the former only is made at the expense of the municipality, and all houses within 50 feet on each side of it are not only *compelled* to have cross-drains immediately constructed to join it, at their *own expense*, but are obliged also to pay a fee, amounting in London to Rs. 32, on doing so. .

78. The principle of dividing the charge of works of sanitary improvement over a series of years, and raising the money immediately required by loan on the security of the rates, has been of late much advocated, and extensively adopted in England ; and the adoption of the same principle in Bombay would, in my opinion, be attended with great advantage.

79. The following extracts on the subject are from the report of the Committee of Health of Towns Association, and on Lord Lincoln's bill for sewerage, drainage, &c. of towns, page 27 :—

“ 44. *Sanitary improvements, to be effectual, must be carried out on a vast scale. There is scarcely a city or town in the kingdom which does not need extensive works, to place either its drainage, its sewerage, or its supply of water, in a satisfactory condition ; and in the great majority, it is necessary that such works should be commenced almost entirely anew. But the difficulty of enforcing, by legislation, the general adoption and completion of works of such magnitude, is the expense which they must necessarily involve.* Had the recent inquiries done nothing to show how this expenditure can be met, but little progress would have been made towards the practical introduction of remedial measures. These inquiries, however, do point out in the clearest manner—1st, how the required capital can be raised ; 2nd, how it can be repaid ; and 3rd, how the repayment can be so distributed as not to be felt as a burthen by the persons who ought, in justice, to defray the expense. These three things having been shown, all real difficulties on the part of the legislature, in enforcing the universal adoption of primary essential sanitary improvement, may be said to be at an end. .

“ 45. The plan proposed is, that whatever capital is required should be raised by a loan, or by persons contracting for the execution of the work, on the security of a special rate, to be levied on the property in the several localities, the principal and interest to be repaid by annual instalments within a limited number of years. On this plan, no immediate outlay is necessary ; the burthen is distributed over a series of years, and, being commuted into an annual rent charge, is not practically felt, even by the poorest tenant.

“ 46. Her Majesty's Commissioners, fully appreciating the importance and the efficiency of this principle, say, in their First Report (Vol. I. page 23) :—‘ The evidence recited generally recognises that principle of legislation to be just and acceptable, which has been suggested

for lightening the burthens of future improvements, by spreading the expense of the outlay over an extended period, so that the cost might be repaid within a reasonable time with interest, by an annual rate, or by an addition to the rent, unless when the persons interested choose to perform the work themselves, under proper regulations, or where they prefer liquidating the charge at once.'

"47. The tenth recommendation of Her Majesty's Commissioners, contained in their Second Report (Vol. I. page 51), is in the following words:—'We therefore recommend that the expense remain a charge upon the properties, to be levied by a special rate upon the occupiers, and recovered with interest by annual instalments within a certain number of years, unless the owners prefer to pay the cost in the first instance.'

"48. A mode of procedure, in accordance with this recommendation, is pointed out in a suggested form of notification (First Report, Vol. II. pages 295, 296), and evidence is adduced to show, from the testimony of men of the highest authority, that the adoption of this principle would at once remove all material difficulty, and give general satisfaction. Thus, it is stated by one of Her Majesty's Commissioners (Dr. Playfair) that the 'distribution of charges for improvement under a competent authority, a system unanimously recognized by eminent practical men, such as those whose evidence I have already brought forward, would obviate all those evils. The charges should be distributed over a term of years co-equal with the probable duration of the improvement.'

"49. In like manner, another of Her Majesty's Commissioners (Mr. Smith of Deanston) states in his report (Vol. II. page 164), that 'the adoption of the principle of dividing the charges over a series of years, and raising the money immediately required by loan on security of the rates, will greatly diminish (he might have said, may be made entirely to remove) the immediate pressure, and so far remove the hostility of the rate-payers to necessary and efficient works of improvement. Besides, substantial justice will be done to life-renters, many of whom have no other source of living, but by a limited amount of rent drawn from house property. Nevertheless, I believe that this jealousy might be abated, by a properly adjusted and revised system of contract management, which would be cheaper than any other.'

"50. Mr. Roe says (First Report, Vol. II. page 169):—'On the principle proposed for the distribution of the charge as a rent over a period, coincident with the benefit, nearly the whole inconvenience, and all injustice to owners of short interests in the immediate outlay, is got rid of. This principle of the distribution of the charge is essential to all plans. It is only justice: the improvement is permanent, and it is manifestly unjust that the whole cost of it should fall on the present owner.'

"51. The evidence, with equal clearness, shows that the cost ought to be charged on the occupier, not the owner. The owner is often merely a lessee, having only a short term of his lease unexpired. No cottage owner has funds at his disposal for any costly improvement; he has very rarely the fee simple, or even an unencumbered life interest in the property. The ownership is frequently so complex that there is the utmost difficulty in discovering it. A man, for example, gives his property to his married daughters, to be equally divided amongst their children. In a case like this, the respective shares in such property could only be ascertained, perhaps, after an expensive chancery suit; while to charge the lessee, or the person in receipt of the rents, who may be within two or three years of the expiration of his lease, with the cost of improvement, not unfrequently amounting to more than the annual rental, would be to confiscate his property. The true remedy for all these evils is not only to distribute the cost over a period commensurate with the benefits, but to fix the charge on the person enjoying the benefit, that is on the occupier, not the owner. 'The only exception,' says Dr. Playfair, 'is the case of monthly or weekly occupiers, when, to prevent the expense of frequent collections, such charge might be made on the owner, who is now to be looked upon in the light of a collector of rents, and, if required, to receive a per-centage for the additional trouble.' "

80. The following table exhibits the comparative executive expenditure and charge for executive superintendence of the Board of Conservancy and the Road and Tank Department for the last six years, for which the accounts have in each case been made up:—

Departments.	Expenditure in the last six Years of which Accounts are made up.	Average per An- num.	Charge of Executive Superintend- ence during same period.	Average per An- num.	Per Cent. of Superin- tendence on Expendi- ture.
	Rupees.	Rupees.	Rupees.	Rupees.	Rupees.
Board of Conservancy	12,79,245	2,13,207	83,633	13,939	6½
Road and Tank Department.	13,55,448	2,25,908	3,87,917	64,658	28½*

* The extraordinary high cost of the engineering superintendence of public works executed by the Indian Government has lately been much commented on in England, and in some cases greatly exaggerated—take for example the following extract from a letter on the subject that has lately appeared in the *Manchester Times and Examiner*.—

"SIR,—Mr. Ewart has obtained a return of the amount of money expended on public works in India for the ten years ending 1845-46, which return shows an expenditure of £399,276 for the Bombay Presidency, in works of irrigation, roads, and bridges. I know of no work of irrigation in the Bombay Presidency, nor can I learn that any such exists, constructed at the cost of Government. As for roads and bridges, one-fifth part of the sum named would

81. From this table it appears that the executive expenditure of the Superintendent of Repairs' Department, for new works and repairs, has

pay for all there are, whether constructed in ten or two hundred years. This account, then, if not altogether an invention, would, if analysed, show one-fifth of the amount expended on works, and four-fifths in salaries. Nor is this to be wondered at, if we consider that the members of the Government are interested in salaries only; in commercial prosperity not at all. The greatest public work undertaken by the Indian Government, beyond all comparison, is that of the Doab canal, in the north-west of Bengal, a work intended both for irrigation and navigation. It is estimated to cost a million and a half sterling, and for which purpose £50,000 a year has been voted. *As a means of navigation, it will produce no return till completed, and at the rate of £50,000 a year, it will take thirty years to complete it, thus involving a loss of one million sterling by interest on unproductive capital, to say nothing of waiting thirty years for the advantages which it promises.* In the hands of private enterprise, the work would be completed in two years. The other principal works of irrigation in India, those of the Madras Presidency, have occupied a still greater length of time in their construction. Operations were commenced on the Cauvery in 1809. In the course of forty-five years Rs. 30,00,000 (£300,000) were expended on it, or at the rate of £8,600 per annum; the revenue (land revenue) having increased in this space of time from Rs. 31,00,000 to Rs. 49,00,000, the gain being close upon Rs. 18,00,000 per annum, the money invested being returned in about two years. The gain on the Godavery operations, with an outlay of Rs. 13,00,000, amounts to Rs. 18,00,000 per annum.

"The moral of these facts is, that public works in the hands of Government are regarded principally as a means of extending patronage, by maintaining an army of superintending officials; and next, that the advantages accruing from such works are devoted to the same end by means of increased land revenue."—*Times and Examiner*, Sept. 8.

The *Bombay Gazette* of the 30th September 1850 contains an elaborate abstract of the annual reports (printed by authority) of the Bombay Road and Tank Department for the nine years ending 30th April 1850, showing the total cost of superintending the public works executed by that department during such period to have averaged 48 per cent., and to have amounted in some cases to upwards 300 per cent.! The following is an extract from the abstract furnished by the *Gazette*—

"We have now before us a complete set of reports of the Road and Tank Department for the nine years ending 30th April 1850. From these we learn, that within this period Government has expended through that department, in the construction of roads and bridges, buildings and tanks, wells and bunds, the sum of Rs. 20,13,098, or an average of Rs. 2,23,677 per annum; and that to superintend these works the Superintendent of Roads, his Assistants, and his 'Subordinate Superintendents' have drawn upon the revenues, in addition, at the rate of fully 48 per cent. upon the outlay—the Superintendent's share of the cost of superintendence being 11·7 per cent.; the share of his Assistants, 13·3 per cent.; and that of his 'Subordinate Superintendents' being 5 per cent.;—the maximum cost of the Superintendent's labour being 13·6 per cent., the minimum 9·5 per cent., and the average 11·7 per cent.; for all his Assistants, the maximum being 50 per cent., the minimum 18·62 per cent., and the average 31·3 per cent. For the labour of Subordinate Superintendents the cost is fixed at the rate of 5 per cent. upon the outlay. Taking the cost of the superintendence of individual Assistants, we find the range to be from 1½ per cent. to 326 per cent.!

* * * * *

"We now proceed to give the cost per cent. of engineering and superintendence, in proportion to outlay. To economise space, we substitute for the heading 'Superintendent of Roads and his Office,' the numeral letter I.; for the 'Assistants,' the numeral II.; for the 'Subordinate Superintendents,' the numeral III., for the 'Total,' the numeral IV.; and for the 'Range of Cost on account of the Superintendence of Assistants,' the numeral V. We beg to explain,

been, on the average of the last six years, Rs. 2,13,000 per annum, or very nearly equal to that of the whole Road and Tank Department, which

that after the year 1845-46 the Superintendent of Roads discontinued giving the cost of his own work, and we have, therefore, no help for it but to take that for the five years ending 30th April 1850 at the five years, which is, of course, in such case, the average of the whole nine years. With these remarks, we now beg to subjoin our statement:—

	I.	II.	III.	IV.	V.
1841-42....	9.5	35 50	5	50 00	77 to 13
1842-43....	13.6	50 00	5	68.60	326 to 15
1843-44....	13.3	42.95	5	61.25	69 to 15
1844-45.. .	10.4	46 60	5	62.00	66 to 30
1845-46....	11.7	26.75	5	43.45	52 to 1.5
1846-47....	11.7	18.62	5	35.32	56 to 1.2
1847-48....	11.7	21.33	5	38 03	66 to 3
1848-49 ...	11.7	21.71	5	37.41	65 to 7
1849-50....	11.7	19 25	5	35 95	255 to 8
Total....	105.3	281 71	45	432 01	
Average....	11.7	31 30	5	48.00."	—Gazette, Sept. 30.

It is true that this 48 per cent. does not represent the total cost to Government of the existing system of superintendence in the Road and Tank Department, inasmuch as in most cases only a portion of the allowances received by the officers therein employed is charged to the works they superintend, nor does it include the cost to Government of the pensions incidental to the present system; but making allowance for these charges, the cost to Government of the present system of superintendence would probably not be found to exceed 100 per cent. It is true that this per-centage would be about forty-five times as much as the Belgium Government has had to pay for the engineering superintendence of the system of railway communication it has constructed throughout its territories; but, on the other hand, it is very greatly less than what the writer in the *Times* asserts, viz. that out of the total cost of public works to the Indian Government four-fifths is expended in salaries.

The return (obtained by Mr. Ewart) wherein the last ten years' expenditure on public works within the Bombay Presidency was stated at about Rs. 40,00,000 may possibly have included repairs as well as new works. The amount is certainly much larger than any one personally acquainted with the deficiencies of the Western Presidency in respect to internal communications would have been prepared to expect.

The *Gazette* of the 7th October contains tables (compiled from the same official data), showing the cost of the personal superintendence of each individual officer of the Road and Tank Department in each year; the lowest rate is that of Mr. Sub-Assistant Conductor Armistead, whose superintendence has averaged $5\frac{1}{2}$ per cent. only on the outlay of the works he has executed during five years' employment; the two highest rates are those of Lieutenants Kembell and Trevor, whose superintendence had averaged 201 and 255 per cent. respectively.

The Bombay Engineers' Report for the official year 1850-51 states the last year's expenditure of the twenty-one engineering establishments included in the return at Rs. 8,65,060-9-3, and the cost of superintendence during the same period at Rs. 2,21,241-13-4, or $25\frac{1}{2}$ per cent.; but this does not include the cost of the Superintending Engineers and their establishments, nor, in most cases, I believe, the "usual 5 per cent. for subordinate superintendence." These statements, however, convey a very inadequate idea of the total cost to the Indian Government of the system under which their public works are executed; for it is the practice, in many cases, to charge only a portion of an engineer's total allowances to the work he superintends, although he may be charged with no other duties than the superintendence

during that period has averaged Rs. 2,25,000 per annum only. It also appears that the cost of superintending the executive expenditure of the of such particular work. For example, in last year's Bombay Engineers' Report, the cost of the Dockyard Engineer's superintendence is stated at only Rs. 600 per mensem, although his cost to Government during the period had been upwards of Rs. 1,000 per month. The same remark applies to the statements published by the Road and Tank Department. In comparing the cost of the system under which the public works of the Indian Government are constructed with that adopted by European Governments (that of Belgium for example), the expense of the pensions incidental to the former must be also considered.

The system of railway communication by which Belgium is traversed was constructed, not by private enterprise, but directly by the Government of the country. The sections opened to traffic up to the 1st of January 1842 had cost £3,023,769, 18s. 6½d., and the total of "salaries had been only £69,749 12s. 9½d., or 2½ per cent. only on the outlay." Even adding to this the expense of printing, instruments, furniture, and "unforeseen and extra expenses," the total charges on the outlay (exclusive of law expenses, which amounted to ½ per cent. only) was under £31,000, or 2½ per cent.

The annual cost of superintendence, &c. for about 70 miles of Belgium railway was as follows:—

One <i>Ingénieur en Chef Directeur</i>	£ 600
Two <i>Ingénieurs Ordinaires</i> , at £320 each	640
Six <i>Conducteurs</i> , at £200 each	1,200
Twenty <i>Surveillants</i> , at £100 each	2,000
Office expenses, printing, &c.	680

Annual total..... £5,120

The average time required for the completion of a line of this length being about two years, the expense of superintendence may be taken in round numbers at about £150 per mile. A late Colonel Commandant of the Bombay Engineers has recently (under the signature of "An Old Indian") addressed a series of letters to the *London Times*, in which many examples are adduced of the terribly slow progress of public improvement in the Western Presidency under the present system. The difficulty experienced by a subordinate Government in obtaining sanction for the expenditure of any but a very limited amount on any one single work in one year causes the very limited total annually available for internal improvements to be frittered away in fifty different dribbles, each requiring a separate and distinct superintending establishment, instead of being concentrated, for the purpose of finishing out of hand some one important work. The great cost of superintendence is not the principal evil of such a system, for few works can be productive until completed; and the loss of interest at present accruing during the tardy progress of a single work would, in many cases, be sufficient for the construction of two such works under better arrangements.

From the Bombay Engineers' Report for the official year 1850-51 it would appear, that the annual expenditure of the various engineering establishments is generally greatly less than such establishments are capable of superintending. Thus, in the southern military division there are 10 officers and establishments employed, yet one of them (at Sattara) appears to superintend, at a cost of only 11 per cent., an annual expenditure (Rs. 2,28,425) about equal to that of the whole of the remaining nine put together; the cost of the superintendence of these latter averaging 32½ per cent., or about three times as much as that of the Engineer at Sattara. It will also appear, that commissioned officers are often employed on petty works which in England would be considered far too simple, and inexpensive in character to require scientific superintendence at all; and in cases where scientific superintendence is really essential, it would often appear to be of a more costly description than necessary. For instance, in page 75 of the last Bombay Engineers' Report, the two first officers in the list of the Road and Tank Department are respectively a Captain and a Sub-Assistant Conductor. Both

Board of Conservancy has been less than a quarter of the charge for superintendence in the Road and Tank Department.

82. The European establishment of the Road and Tank Department consists of 1 Superintendent, 2 First Assistants, and 7 Second Assistants (in all ten officers of the line or Engineers), assisted by 8 trained European Overseers, mostly non-commissioned officers of the Sappers and Miners. I believe there is no Second Assistant in the Road and Tank Department in charge of a single extensive work, who has not one or more trained European subordinates on his establishment. The Superintendent of Repairs, though in charge of works equal in amount to those of the whole Road and Tank Department, has no European executive subordinate whatever, and I think it is essential to the due superintendence of the works under his charge that this deficiency should be remedied.

83. It must be remembered, moreover, that the officers of the Road and Tank Department have no other duties to attend to than those of an executive engineer; but that the Superintendent of Repairs, in addition to the control of an executive expenditure exceeding Rs. 2,00,000 per annum, and involving the superintendence of works often exceeding 20 in number, and scattered over 130 miles of road, has also to perform the equally onerous functions of Surveyor to the Court of Petty Sessions, and to listen daily to the representations of every one (out of a population of half a million) who wants to build or repair a house, or thinks himself aggrieved by any summons or notice issued from either of the two departments.

84. It may be objected to the above comparative statement, that the works executed under my superintendence are all in the same neighbourhood, while those of the Road and Tank Department are scattered over a large extent of country; and that the cost of superintendence would be naturally greater in the latter case. I will therefore cite a case more directly in point. The annual executive expenditure of the Executive Engineer at Poona is only from Rs. 60,000 to Rs. 90,000 per annum, yet he has three Europeans on his executive establishment. I believe he has no other duties than those of an Executive Engineer to attend to, and his works are confined to a cantonment only containing a length of, I should think, not more than 15 miles of road. The

seems to be employed on precisely the same description of work. The annual expenditure, and the amount of the estimates sent in by the Sub-Assistant Conductor, rather exceed those of the Captain, but the cost of the superintendence of the latter is stated at nearly double that of the Sub-Assistant Conductor. And it is really very much more than double, inasmuch as the total cost to Government of a Captain employed as a First Assistant in the Road and Tank Department is about Rs. 738 per mensem, of which only Rs. 325, or less than half, is charged to the works which it is his sole employment to superintend.

executive expenditure of my office has during the last six years averaged more than double this, viz. Rs. 2,13,207-9-6, and is increasing, and the works are scattered over 130 miles of road: yet, at present, I have no European subordinate in the executive branch of my office.* The cost of superintendence in the Executive Engineer's at Poona is stated by Major Turner (page 13 of the Bombay Engineers' Report for 1850-51) to have been, during the past year, 29½ per cent. on the expenditure, or rather more than the corresponding charge in the Road and Tank Department.

85. The rates given in Appendix F, at which the works of the Conservancy Department have been estimated and executed, are lower than those of any other executive department in Bombay.†

The office rates of the Superintendent of Repairs' Department were, at my suggestion, forwarded by the Board of Conservancy to the Military Board in December last, for comparison with those of other executive departments at Bombay, and by the minutes of the Garrison Engineer and Civil Architect on them, forwarded with the Secretary to the Military Board's letter No. 826 of 1852, it appeared that the rates of the two principal descriptions of works, in the Superintendent of Repairs' Department (masonry and road metalling), were in each case 20 per cent.

* The business of my office has of late years greatly increased, without any increase having taken place in the strength of the establishment. The number of periodical returns, together with those required by new standing orders, has been more than trebled during the last two years. The number of pages of correspondence despatched from my office during the ten months that have elapsed of the present year are more than double the average of the corresponding ten months of the three years preceding my taking charge of the office, and the increase in the number of pages of estimates forwarded is in the ratio of 17 to 11. When the Board was first established in 1845,—the municipal revenue for the three preceding years having been, for 1842-43, Rs. 2,17,980-5-5; 1843-44, Rs. 2,21,064-13-4; 1844-45, Rs. 2,24,860-15-5, or on the average of these three years Rs. 2,21,302,—the establishment of the Superintendent of Repairs was fixed at Rs. 2,089 per mensem; and the necessity of considerably increasing such establishment appears to have been contemplated by the wording of Clause 13 of Act No. XI. of 1845, wherein the Bench were authorised (subject to the approval of Government) "to appoint one or more Superintendents of Repairs." The municipal income during the last three years has been, for 1849-50, Rs. 3,80,677-13-10; 1850-51, Rs. 3,49,149-0-9; 1851-52, Rs. 3,96,042-14-1, or on the average of three last years Rs. 3,75,290, or 41 per cent. more than the average of the three years immediately preceding the appointment of the Board; yet during this period my establishment has been increased from Rs. 2,089 to Rs. 2,229 monthly, or 6½ per cent. only, and even this does not represent an increase in the number of individuals employed so much as increase of pay on account of long service to some of the Natives employed by the department. At present, my establishment is so weak handed, that by temporarily attending to any single branch of the duties of the office in the manner that in my opinion every branch ought always to be attended to, other duties must of necessity be unduly neglected.

† There are generally about 20 new works in hand at a time; the greatest number last season was 37: the largest number of workmen employed daily by this department has been about 4,000; at present the number is under 2,000.

lower than the corresponding ones of the Garrison Engineer and Civil Architect's office.

86. I attribute the fact of the contracts letting so low in the Superintendent of Repairs' office solely to the circumstance of their being disposed of by verbal tender in public auction, instead of by written tender, as is generally the case in other departments. It is evident that by the latter method the benefit of the principle of completion cannot possibly be so fully realized as it is by the former.

87. The rate (1*d.* per square yard per annum) of the road-repairing contract* I consider less than the work can be properly done for. My predecessors were also of opinion that the rate at which the repairing and scavenging contracts was let by the Bench was too low; emulation, and the temptation afforded by the large monthly payments to be made on account of the contract (which is for three years) often inducing Native contractors to tender at a rate at which they can only make a profit by evading the proper performance of the work, and the small numerical strength, and low pay and condition of the Native subordinates of the supervising establishment facilitates their doing so.

88. In last year's Report of the Health Committee to the Borough of Liverpool, it is said with reference to contracts:—"The course adopted is to select the parties who tender for the work; and this has been found to be attended with the best results, as the Committee have the guarantee of character for the proper fulfilment of the contract, a security being, in the estimation of the Borough Engineer, and in our opinion, far better than the guarantee of a bondman."

89. I fear there would be great difficulty in selecting trustworthy contractors in this country: in the course of my experience in India I have not succeeded in discovering any of the sort.

90. The Supervising Board, corresponding in English town with the Board of Conservancy at Bombay, is sometimes composed of *ex officio* members, and sometimes of stipendiary and elective. The old elective commissioners system has in England been found productive of much jobbery and useless expenditure (the first regarding house property affected by public improvements, and the last through the assumption of executive functions by supervising boards); the system would be much more liable to such abuses in India. Since the recognition of the vital importance of the sanitary question in England, it has been felt that the maintenance of the public health is a function of Government, too important to be altogether delegated to irresponsible and fluctuating local boards, and the tendency of subsequent legislation appears to be

* The roads are made and repaired with basalt, a material excellent for heavy traffic, but far too hard to admit of being reduced to a surface as smooth as that of a limestone road.

to define the exact functions and powers of such boards very strictly, and to subject them to a central controlling authority.

91. The pecuniary loss arising from the mistakes of local boards is very considerable. In London it is calculated that nearly Rs.1,00,00,000 has been uselessly expended in making drains at wrong levels. Through the want of contoured surveys of the town, our town surveys are more defective in this respect than those of London could ever have been. The Native Surveyors of Bombay are untrained in the use of the spirit-level, and their mason's plumb-line level is altogether unsusceptible of the degree of accuracy required in taking sections of considerable length : it may therefore be presumed that there must have been a very considerable loss on this head at Bombay as well as in London.

92. There has also been a loss both of money and efficiency from the faulty flat-sided section of drains hitherto adopted : the egg-sloped sewer has now quite superseded the flat-sided forms in England, and I hope to introduce it at Bombay in all future works of this class. It is calculated (First Report, Vol. II. p. 462) that had the sewers executed during the last ten years in London been constructed on the egg-sloped instead of on the upright-sided section, a saving of nearly Rs. 25,00,000 would have been effected.

93. On comparing the published annual reports of the Board of Conservancy with those of similar boards in England, it will be seen that a correct census is essential to the completeness of such documents. I believe that (were a system suited to local circumstances adopted) no insuperable difficulty would be found to exist to the obtainment of an accurate census of Bombay, and I hope shortly to forward to the Board a report on the subject. No accurate census or mortality returns yet exist for any town population within the tropics, and the vital statistics of Bombay would therefore have a peculiar interest. It would be interesting to ascertain the effect of the extraordinary density of our town population on the mortality returns. I suspect it would be greatly neutralized by the open-air habits of the population, and the absence of glass windows or other checks to ventilation in their dwellings. It is also probable that the chances of infant life would be found to be much greater in our climate than in England.

94. Appendix G contains a rough estimate of certain public improvements which, for the reasons I have before given, I think are urgently and immediately required. They form a portion of the list and rough estimate for completing the drainage of undrained *made* streets within the town limits, forwarded to the Board by my predecessor, Captain Cruickshank, with his letter No. 338 of 1845.

95. This rough estimate, which only included roads within the town limits, and already made, amounted to Rs. 10,00,000. Captain Cruick-

shank framed no estimate for the expense of constructing and sewerage the unmade roads within the town limits, or for main drains, or for the drainage of all portions of the island beyond the town limits, but he guessed them at about the same amount, and thought, that after providing for *their* just annual claims on the municipal expenditure, it would still be possible to get through his estimate for the drainage of the *made* streets within *the town limits* at the rate of Rs. 50,000 per year, and that, at that rate of progress, the drainage of the island might be completed in twenty years. It has not, however, been *found* possible to expend more than Rs. 20,000 per annum, in getting through the improvements estimated for in Captain Cruickshank's list; and the period he assigned for the completion of the drainage of the island must therefore be extended, perhaps not quite, in the ratio of 5 to 2, yet still very considerably.

96. The list of streets undrained, though already made within the town limits, conveys a very inadequate idea of the total drainage requirements of the Native Town. About one-third of the Native Town is comprised of what once *were*, and what are still called, "oarts." Forty years ago there were cocoanut plantations bounded by the principal bazar roads; when the town increased, their street-frontage was allowed to be often wholly occupied by houses, without any provision being made for proper roads in the interior; and the deficiency still exists, though these oarts have now become as densely populated as the original and regularly laid out portion of the Native Town. The houses within the oarts are clustered together at random, and in all sorts of ways, without any regular space being left between them for approaches, and with a total absence of all attempt at arrangement or uniformity, such as could not occur in any other country.

97. I have deemed that I could not satisfactorily answer a question relating to the proportion our municipal revenue bears to the urgent and immediate sanitary demands upon it, without laying before the Bench, as in the foregoing report I have endeavoured to do, as practical and intelligible a statement as was possible, of the present actual sanitary condition of our population, and of the little that had been done, and of the very much which still remains to do, towards improving it. I think that the data I have advanced warrant the conclusion that a very large proportion, probably nearly one-half of the deaths, from 12,000 to 16,000 in number, that annually occur in this island, are preventable, and due to causes which it comes within the province of Government and of the municipality to remove; *and also that the pecuniary means appropriated by Government to this object, and administered by the Board, are altogether incommensurate with the numbers of our population, and with the vast amount of preventable disease and death constantly taking place among us.*

98. The apathy that exists in Bombay, and that long existed in England, regarding the waste of human life, consequent on defective sanitary arrangements, is much to be deprecated. "When a ship has sunk," says a recent writer on the subject, "or a building has fallen, there is an immediate cry for the punishment of some individual whose selfishness or carelessness has led to the calamity, in order that all men be warned against the like dereliction of duty in time to come; yet how few remember, that besides these occasional droppings, which so startle the ear, there is a great stream of death and misery holding its onwards course, as to which they have never asked the question, whether or not the bulk of its dark waters may be lessened."

99. "It is clear, therefore" (says the Report of the Health of Towns Association, on Lord Lincoln's Sewerage and Drainage of Towns Bill), "that though we remain inactive, disease and death do not. For the last eight years, the startling fact has been proclaimed, and has been constantly urged on the attention of the public and legislature, that every day's delay in the adoption of efficient sanitary measures cost the lives of 136 persons in England alone. * * * Why must this waste of life go on unrestrained, without even any attempt to check it?"

100. I have shown that Dr. Simpson, the Medical Officer of Health to the City of London, declares emphatically in his reports, year after year, that unless the promises of science be not an empty delusion, it is practicable to reduce human mortality within the town to the half of its present average prevalence.

101. Though Dr. Simpson's authority is a high one, and his opinion supported by authentic English data, and its correctness is apparently borne out at Bombay by the low rate of mortality of our only drained town district (the Fort), as compared with that of the island generally, it is of course possible that he may overrate the amount of human disease and death that can be prevented by improved sanitary arrangements, in stating it so high as 50 per cent. on the total mortality. But the *exact specific* per-centage by which the mortality might be reduced is not the immediate question: say it was not 50, but only 30 per cent., or even not more than 20 per cent.; still, at even the lowest of these rates, the mortality of Bombay would be reducible by about 3,000 deaths a year, and surely this would be a saving of human life well worth any efforts that could be made by a Government or municipality.

I have the honour to be, &c.

H. CONYBEARE,
Superintendent of Repairs.

Bombay, Superintendent of Repairs' Office, 31st March 1852.

APPENDICES.

APPEN

Details of the Income of the Board of Conservancy from all Sources, for Year's Total Expenditure, and the State of the Board's

	For 10 Months and 21 Days of 1845-46.			1846-47.			1847-48.			1848-49.		
	Rs.	a.		Rs.	a.	p.	Rs.	a.	p.	Rs.	a.	p.
House Assessment	94,929	14	1	1,32,904	3	10	1,44,878	3	11	1,52,081	3	6
Assessment on Government Buildings										12,021	8	0
Market Fees	3,228	9		29,627	9	5	33,248	11	2	65,573	12	2
Wheel Tax	45,105	6		49,872	11	7	41,648	10	5	38,918	9	0
Fees on Sale of Liquor Licenses..	433	0		48,992	3	11	21,592	4	5	21,516	14	8
Fees, &c. levied by the Court of Requests	5,422	0		7,416	0	0	7,743	0	0	8,221	0	0
Ditto ditto by the Collector of Land Revenue	386	3		2,187	14	0	4,325	14	0	3,454	5	9
Penalties levied by the Assistant Collector of Land Revenue ..	510	0		617	8	0	619	0	0	611	0	0
Fines levied by the Court of Petty Sessions	5,760	9		5,610	0	0	4,997	0	0	3,010	9	8
Ditto ditto by the Magistrate.	9,119	13		23,642	14	6	16,766	9	3	17,846	15	0
Private Contributions, and Sun- dries.	22,520	9	0	3,528	8	0	828	1	6	10,870	0	0
Total Income of the Year	1,87,416	2		3,04,729	9	3	2,76,677	6	8	3,31,155	14	3
Cr. or Dr. Balance of last Year..	+ 1,00,441	13		+ 8,724	3	11	- 5,676	3	6	- 37,800	12	0
Total available Funds	2,87,856	15		3,13,453	13	2	2,71,001	3	2	2,96,355	2	3
Deduct Year's Expenditure	2,79,136	11		3,19,130	0	8	3,08,801	15	2	3,13,514	1	0
Cr. or Dr. Balance in Account with Government	+ 8,724	3	11	- 5,676	3	6	37,800	12	0	- 17,188	14	9

REMARKS.—From this table it will be seen the Board's total income for 1850-51 was Rs. 41,533 less than that of the previous year, and that Rs. 23,000 of this deficiency was due to a falling off in the wheel tax. This falling off having been occasioned by temporary causes, and the accumulation of arrears, the tax ought more than to recover itself this year.

By the abolition of the Court of Requests, Government has deprived the Board of an item of revenue hitherto averaging Rs. 6,852 per annum.

The alteration lately made in the collection of the municipal taxes will have the apparent effect of increasing the Board's revenue by Rs. 25,802, before it really increases at all. Previous to the appointment by the Board of a Collector of Municipal Taxes, the income arising from such taxes was entered in the credit side of the accounts, less the cost of collection, which in 1849-50 amounted to Rs. 25,832. Now the gross produce of these taxes is carried to the credit of the Board, and the cost of collection charged to expenditure.

I have compiled this table from the published accounts of the Board, making corrections in two instances

DIX A.

each Year, from 1845-46 to 1852-53, both inclusive; showing also each Account with Government at the close of each Year.

1849-50.	1850-51.	1851-52.	1852-53.	Total for 8 Years.	Yearly Average.
Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.
1,57,720 5 5	1,63,064 8 5	1,65,119 6 8	1,71,872 12 0	11,82,570 9 10	1,47,821 5 2
12,899 0 0	12,904 0 0	25,798 0 0	.....	63,622 8 0	12,724 8 0
68,115 14 4	62,311 9 6	59,093 8 0	60,517 2 4	3,81,716 12 5	47,714 9 6
79,153 10 6	56,063 9 0	83,413 7 3	79,092 13 0	4,73,338 13 5	59,167 5 8
32,198 8 7	25,500 5 2	9,561 3 7	34,569 12 3	1,91,664 4 7	21,333 0 6
6,000 0 0	6,281 0 0	5,895 0 0	.....	47,008 0 0	6,715 6 10
2,233 13 0	2,826 2 0	3,500 2 4	3,924 12 0	23,139 2 5	2,892 6 3
486 0 0	370 0 0	250 0 0	510 0 0	4,003 10 0	500 7 0
3,023 4 0	2,666 2 8	2,292 15 9	5,568 0 8	32,933 10 0	4,116 11 3
13,946 15 0	15,816 4 0	18,042 10 5	17,932 7 3	1,33,114 9 7	16,639 5 2
4,590 7 0	1,340 8 0	23,046 8 1	8,026 5 7	74,750 15 8	9,343 13 11
3,80,677 13 10	3,19,119 0 9	3,96,012 14 1	3,82,014 1 1	26,10,862 13 11	3,31,968 15 3
—17,188 14 9	+91,150 10 8	+1,39,113 15 11	+78,757 9 0		
3,63,488 15 1	4,40,299 11 5	5,35,156 14 0	4,60,771 10 1		
2,72,338 4 5	3,91,185 11 6	4,60,019 1 2	3,18,057 4 3		
+91,150 10 8	+1,39,113 15 11	+75,137 12 10	+1,12,714 5 10		

in which fees to which the Board were not entitled were erroneously drawn from the Treasury, and afterwards refunded.

From the lower columns of the above, it will be seen that the Board commenced operations with a credit balance with Government of Rs. 1,00,414; that this balance soon became a debit one; and that the Board's expenditure on municipal improvements continued to be kept in advance of their assets till the close of 1849-50. Since then the funds of the Board have been hoarded up (with what object I am not aware), and a large balance has now accumulated. Scarcely a third of the improvements recommended to Government in the Board's Report of 1849-50 have yet been sanctioned, the plans and estimates I have forwarded for many of them being ordered by the Board to stand over.

N.B.—The credit balances are marked + (plus), the debit ones — (minus); the former class being always added to, and the latter subtracted from, the year's income, to give the total available funds for each season's operations.

Particulars of the Board's General Expenditure, for

Items.	For 10 Months and 21 Days of 1845-46.	1846-47.	1847-48.
	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>
Police contribution,	37,500 0 0	45,000 0 0	45,000 0 0
Clerk to the Board of Conservancy, establishment, stationery, &c.	6,134 6 1	8,483 4 4	7,908 6 4
Clerk to the Public Markets, and contingent charges, &c.	4,098 6 11	5,517 3 9	5,268 11 9
Collector of Municipal Taxes, &c. &c. ....	.....	.....	.....
Assessor of Houses and Buildings, &c. ....	.....	.....	.....
<i>Executive Expenditure.</i>			
Maintenance and extension of public works and improvements, &c.	2,08,504 10 7	2,81,551 5 4	2,22,790 2 1
Executive establishment of the Superintendent of Repairs	11,076 4 10	14,407 4 3	13,703 1 2
Establishment of ditto for supervising and enforcing the local regulations relating to public health and convenience	11,522 14 10	14,172 15 0	14,131 9 10
Total	2,79,136 11 3½	3,19,130 0 8	3,08,801 15 2

REMARKS.—It will be seen, that from the first complete year after the institution of the Board up to the close of 1849-50, the establishments and permanent charges of the Board underwent no material alteration.

During 1850-51, an arrangement was made by the Board with Government, under which the assessment and collection of certain of the municipal taxes was transferred from a Government Officer to a Collector appointed by the Bench, and subject to the Board; the Government Officer being compensated by an increase of the Board's contribution to Police.

In the notes on Table A, I have shown that the first effect of this alteration will be an apparent increase of the income of the Board, amounting to the former cost of collection.

The actual effect of this arrangement on the permanent charges on the Municipal Fund, on account of the Police contribution establishment, and assessing and collecting charges, will appear by the following comparative statement of these charges for 1849-50 and 1851-52, the years previous and subsequent to such alterations:—

From Appendix G of the Board's Report to Government of 1849-50.

Contributions to Police Rs. 45,000

ASSESSING AND COLLECTING CHARGES, AND COLLECTOR'S COMMISSION.

House Tax.

Assessing charges	Rs. 3,480
Contingent charges	650
Collector's commission	8,000
	<u>12,130</u>

Shop and Stall Tax.

Expenses of collection	Rs. 6,516
Contingent charges	500
	<u>7,016</u>

Wheel Tax.

Assessing establishment	Rs. 906
Collecting ditto	1,800
to extra ditto	800
Collector's salary	3,000
	<u>6,506</u>

Rs. 900

DIX B.

each Year, from 1845-46 to 1852-53, both inclusive.

1848-49.	1849-50.	1850-51.	1851-52.	1852-53.	Total for 5 Years.
Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.
45,000 0 0	45,000 0 0	48,333 5 4	53,000 0 0	53,329 11 8	3,72,163 1 0
8,049 13 3	7,886 1 6	8,096 1 0	7,729 7 2	7,841 10 0	62,429 1 8
4,767 12 5	4,784 11 0	4,778 11 1	4,807 4 2	4,892 7 5	38,915 4 6
.....	.....	6,247 12 1	18,993 15 6	22,092 1 3	47,333 12 10
.....	.....	1,608 2 4	4,918 13 11	3,938 10 8	10,465 10 11
2,27,040 12 2	1,85,933 13 7	2,03,424 13 6	3,12,013 0 5	2,27,713 12 2	18,98,977 5 10
14,496 15 8	14,964 14 5	14,990 11 8	15,152 15 0	14,826 14 5	1,13,619 1 5
14,181 11 6	13,768 11 11	13,706 2 6	13,403 9 0	13,117 0 8	1,08,304 11 3
3,13,544 1 0	2,72,338 4 5	3,01,185 11 6	4,60,019 1 2	3,48,057 4 3	26,52,208 1 5

Salary and establishments of the Clerk to the Board of Conservancy, the Superintendent of Repairs, and the Clerk of the Markets Rs. 43,300

Less the following items :—

(First three included in the scavenging contract since 1st December 1850, and 4th cancelled.)

Establishment for cleaning necessary at Cannmattee Poora, and removing the night-soil from the station at Kharra Tank, from 1st May to 31st December 1850 .. Rs. 1,345 15 10

Establishment for cleaning necessary adjoining Shuk Abdoola Packmosia Street, from 1st May to 31st December 1850 372 0 0

Removing night-soil from the necessary and Halalcore station at Sonapoor, from 21st September to 30th November 1850 1,091 0 6

Temporary establishment entertained for opening and shutting gates of the Love Grove Sluices, from 1st April to 14th May 1850 56 9 8

2,868

40,432

Total....Rs. 1,11,234

From Appendix G of the Board's Report to Government for 1850-51, "Certain Expenditure" of 1851-52.

Contribution to Police.. .. . Rs. 53,000

Commission to the Collector of Municipal Taxes 3,000

Salary and establishment of the Clerk to the Board of Conservancy, the Superintendent of Repairs, Collector of Municipal Taxes, Clerk of the Markets, Assessor of Houses and Buildings 60,700

Total permanent charges under new arrangement .. Rs. 1,16,700

Deduct ditto before the alteration 1,11,234

Excess in cost of new arrangement .. Rs. 5,466

APPEN

Particulars of the Board's Executive Expenditure, for

Years.	EXECUTIVE Extension and Maintenance of			
	New Works.	Repairing and Watering Roads.	Repair and Clearing of Drains, and Scavenging the Town.	Widening Roads, under Building Cer- tificates.
	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>
For 10 months and 22 days* of 1845-46.	1,21,669 12 6	55,008 1 4	23,092 1 4	4,155 5 10
Ditto ditto 1846-47.	1,00,153 8 0	73,414 11 1	40,342 5 2	9,836 4 3
Ditto ditto 1847-48.	1,00,336 7 0	76,611 7 7	38,681 8 6	3,639 13 6
Ditto ditto 1848-49.	82,514 6 1	95,607 5 10	35,000 0 0	5,140 7 11
Ditto ditto 1849-50.	55,249 5 9	79,290 4 6	35,000 0 0	7,792 9 1
Ditto ditto 1850-51.	75,575 10 0	73,889 3 10	37,166 10 8	6,774 5 2
Ditto ditto 1851-52.	1,82,506 8 10	77,500 0 0	41,500 0 0	5,616 15 9
Ditto ditto 1852-53.	83,015 0 10	87,210 3 6	41,500 0 0	4,534 1 7
Total for eight years	8,01,020 11 0	6,18,531 5 8	2,92,282 9 8	47,489 15 1
Yearly average	1,00,127 9 4	77,316 6 8	36,535 5 2	5,936 3 1

* The Board commenced operations on the 10th of June 1845, when

REMARKS.—The average executive expenditure of the Board has for the last eight years averaged Rs. 2,37,872 per annum. Of this, Rs. 1,06,083 per annum has been for new works, Rs. 1,00,127 for works requiring special sanction, and Rs. 5,956 for widening roads by the retirement of individual houses under building certificates; the remainder, Rs. 1,31,280, has been expended on the repairs and maintenance of public works.

The total executive expenditure in the last eight years has been Rs. 18,98,977, and the total charge for executive superintendence Rs. 1,13,616 during that period (or about 6 per cent. on the former). This is a very low charge

DIX • C.

each Year, from 1845-46 to 1852-53, both inclusive.

EXPENDITURE.				Total of Executive Expenditure.	Total of Executive Establishment.
Public Works and Improvements.					
Work done Departmentally.	Lighting.	Under Clause IX. Act XI. of 1845, and Miscellaneous Charges.	Annual Repairs to Public Buildings.		
Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.
652 0 0	46 12 4	46 15 0	3,833 10 3	2,08,504 10 7	11,076 4 10
.....	419 15 10	151 4 8	7,233 4 4	2,81,551 5 4	14,407 4 3
558 1 11	255 7 10	82 10 0	2,624 9 9	2,22,790 2 1	13,703 1 2
2,020 9 5	227 7 6	67 15 9	6,462 7 8	2,27,040 12 2	14,493 15 8
2,529 4 1	193 3 6	111 8 0	5,767 10 8	1,85,933 13 7	14,964 14 5
2,931 10 0	175 4 7	158 2 0	6,753 15 3	2,03,424 13 6	14,990 11 8
252 0 0	.....	598 11 2	34,038 12 8	3,42,013 0 5	15,152 15 0
231 0 0	.....	720 1 2	10,508 5 1	2,27,718 12 2	14,826 14 5
9,174 9 5	1,318 3 7	1,937 3 9	77,222 11 8	18,98,977 5 10	1,13,616 1 5
1,146 13 2	219 11 3	242 2 5	9,652 13 5	2,37,372 2 8	14,202 0 2

one month and nine days of the official year had already elapsed.

for India. The charge of superintendence in the Garrison Engineer and Civil Architect's Department is, I am informed, about 20 per cent. ; and in the Road and Tank Department it is stated in one of their published reports, quoted by Captain Cruickshank in his letter No. 34 of 1846, to vary from 16 to 9 per cent. on the executive expenditure.

I have since ascertained, that on the average of the last six years' operations, the charge for superintendence in the Road and Tank Department has been 2s. 7d. per cent. on the expenditure.

APPEN

Particulars of Munici

Years.			Clerk to the Board of Conservancy, Establishment, Stationery, &c.	Clerk to the Public Markets.	Collector of Municipal Taxes, &c. &c.	Assessor of Houses and Buildings, &c. &c.
			<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>
For 10 months and 29 days* of 1845-46.			6,434 6 1	4,098 6 11	.....	.....
Ditto	ditto	1846-47.	8,483 4 4	5,517 3 9	.....	.....
Ditto	ditto	1847-48.	7,908 6 4	5,268 11 9	.....	.....
Ditto	ditto	1848-49.	8,019 13 3	4,767 12 5	.....	.....
Ditto	ditto	1849-50.	7,886 1 6	4,781 11 0	.....	.....
Ditto	ditto	1850-51.	8,096 1 0	4,778 11 1	6,247 12 1	1,608 2 4
Ditto	ditto	1851-52.	7,729 7 2	4,807 4 2	18,993 15 6	4,918 13 11
Ditto	ditto	1852-53.	7,841 10 0	4,892 7 5	22,092 1 3	3,938 10 8
Total for eight years.....			62,429 1 8	38,915 4 6	47,333 12 10	10,465 10 11
Yearly average			7,803 10 2	4,614 6 6	15,777 14 11	1,308 3 4

* The Board commenced operations on the 10th June 1845, when one

REMARKS.—Establishment for supervising and enforcing the local regulations relating to public health and conveniences.—This is effected by a system of sanitary Police. The island is divided into four divisions, each under the charge of a European Inspector. Each division is again sub-divided into beats, each consisting of a certain length of street or road, and under the charge of a Peon. Each Peon is expected to perambulate his beat early every morning, taking note of every offence against the Nuisance or Building Act, and reporting them to the European Inspector of his division. On receiving the reports from all his beats, the Inspector examines each case personally, and his report is brought to the Superintendent and Surveyor's office. The Purvoo of the division there

DIX D.

pal Establishment.

Establishment super- vising and enforcing the Local Regulations relating to Public Health as it were.	Executive Establishment.			Total of Executive Expenditure.
	Permanent.	Extra.	Total.	
<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>
11,522 14 10	8,521 11 3	2,554 9 7	11,076 4 10	2,08,504 10 7
14,172 15 0	11,716 15 0	2,690 5 3	14,407 4 3	2,81,551 5 4
14,131 9 10	12,171 3 4	1,531 13 10	13,703 1 2	2,25,790 2 1
14,181 11 6	12,826 6 2	1,670 9 6	14,496 15 8	2,27,040 12 2
13,768 11 11	13,335 9 6	1,629 4 11	14,964 14 5	1,85,933 3 7
13,706 2 6	13,412 2 6	1,578 9 2	14,990 11 8	2,03,424 13 6
13,403 9 0	13,414 10 7	1,738 4 5	15,152 15 0	3,42,013 0 5
13,417 0 8	13,539 9 6	1,287 4 11	14,826 14 5	2,27,718 12 2
1,08,304 11 3	90,938 3 10	14,680 13 7	1,13,619 1 5	18,98,977 5 10
13,538 1 4	11,367 4 5	1,835 1 8	14,202 6 2	2,37,372 2 8

month and nine days of the official year had already elapsed.

fills up summonses for the Court of Petty Sessions in each case, which summonses are then initiated by the Surveyor to the Court of Petty Sessions, and then served by the Peons in the several beats. The summonses are numbered like cheques, and the counterpart remains in the office records. The number of summonses issued is about 1,000 per annum. Nearly all the eight months of fair season, each European Inspector is expected to visit every beat in his division once in 10 days, without previous warning to the Peon in charge, who is punished for neglect of duty if the Inspector discovers any unreported nuisance of more than a day's standing in his beat.

APPENDIX

Work-people employed by the Contractors for the

Years.	BY THE ROAD-REPAIRING			
	Labourers, Days' Work.	Cart-loads Metal.	Cart-loads Sandstone.	Labourers, Days' Work for Watering Roads.
For 1845-46	103,157	29,653	6,841	....
For 1846-47	92,322	39,952	7,550	....
For 1847-48	111,927	49,810	8,887	....
For 1848-49	108,392	35,310	8,713	....
For 1849-50	122,885	43,156	10,070	....
For 1850-51	113,951	32,776	9,819	6,751
For 1851-52	130,863	41,835	18,638	6,740
For 1852-53	121,825	30,814	7,415	6,764
Total for eight years	908,322	303,506	77,993	20,255
Yearly average	113,501½	37,913½	9,740½	6,751½

REMARKS.—Bombay, with a population of 519,000, contains 130 miles of macadamized streets; the extent of unmade roads and courts is not ascertained. Liverpool, with a population of 361,000, contains 174 miles of paved or macadamized carriage-way, and 69 miles of courts and passages. The average width of the streets and roads of Bombay is 27 feet; there are therefore 2,059,200 square yards of road surface. The cost of repairs and maintenance is at the rate of 8 pies or 1*d.* per square yard per annum. This is very low—less than one-fifteenth of the London rate, and only about one-eleventh of the Liverpool rate. From a document laid before the Marylebone Vestry by the Surveyor to that district in September 1851, an abstract of which is published in the *Civil Engineer and Architect's Journal* of October 1851, it appears, that on the average of the last twelve years, the cost of keeping in repair the macadamized roads of that district has been, for those of the greatest traffic 1*s.* 8*d.* or 13 *as.* 4 *p.* per yard, for those of the least traffic 7½*d.* or 4 *as.* 10 *p.* per yard, and for the average of the whole 1*s.* 3*d.* or 10 *as.* per yard.

In the last report to the Health Committee of the Borough of Liverpool by the Borough Engineer, Inspector of Nuisances, and Medical Officer of Health, Liverpool, 1851, the highest rate of repair for the macadamized roads in Liverpool, on an average of three years, is stated at 1*s.* 6½*d.* or 12 *as.* per yard, the lowest 3*s.* 3*d.* or 1*s.* 1-10-0

DIX·E.

Repairing and Scavenging of the 130 Miles of Streets.

CONTRACTOR.		BY THE SCAVENGING CONTRACTOR.			
Watering Carts, Days' Work.	Amount of Contract.	Labourers, Days' Work.	Carts, Days' Work.	Sepoys, Days' Work.	Amount of Contract.
	<i>Rs. a. p.</i>				<i>Rs. a. p.</i>
....	67,641 10 8	....	....	....	26,000 0 0
....	73,531 4 0	....	....	....	36,997 11 8
....	73,305 14 6	....	....	....	35,513 12 0
....	82,443 7 10	....	....	....	35,000 0 0
....	77,793 13 4	....	....	....	35,000 0 0
25,772	77,505 8 0	100,793	23,841	10,900	41,500 0 0
25,650	77,505 8 0	105,285	23,934	10,895	41,500 0 0
25,782	77,505 8 0	111,323	31,377	11,854	41,500 0 0
77,204	6,07,132 10 4	317,401	89,152	33,649	2,96,011 10 8
25,734½	75,929 1 3	105,800½	29,717½	11,216½	37,001 7 4

per yard; the mean would be therefore near 11s. 3d. At Liverpool, the streets of greatest traffic are paved with squadron stones, and the repairs and maintenance of streets so paved is comparatively inexpensive.

Scavenging.—The scavenging of Bombay, with a population of 519,000, 130 miles of metalled carriage-way, and an extensive surface of unmade streets and courts, has cost Rs. 37,001 per annum on the average of the last eight years. The scavenging of Liverpool, with a population of 339,000, 17½ miles of carriage-way, and 69 miles of passages and courts, Rs. 1,00,021 per annum,* and the scavenging and dusting of the city of London, with a population of about 1,400,000, has cost on the average of the last six years Rs. 69,730 per annum.† By the sale of dust to the brick founds of the Metropolis, this has, however, been reduced to Rs. 57,880 per annum. Everywhere in the city of London, and generally in Liverpool, the courts and passages being paved with flag-stones, present an unabsorbent surface, which requires comparatively little cleaning.

* Report to the Health Committee of the Borough of Liverpool by the Borough Engineer, Inspector of Nuisances, and Medical Officer of Health. Liverpool 1890.

† Mr. Haywood's (Surveyor) Report upon Street-cleaning to the City Sewer Commissioners. London, October 1891

APPENDIX F.

Containing, 1st, a List of the New Works executed at the Cost of the Municipal Fund, since the institution of the Board of Conservancy; 2nd, the Mode in which such Works are let to Contract; and 3rd, the Rates at which they are estimated, and have been executed.

1ST.

A List of the New Works executed at the Cost of the Municipal Fund, since the institution of the Board of Conservancy.

	Rs.	a.	p.
27th March 1843.—Completing Portuguese Street (on which Rs. 3,004-7-6 had been previously expended from the County Fund.)	97	13	6
Ditto.—Ditto Trimbeck Purushram Street (do. Rs. 3,273 do. from do.)	98	0	0
Ditto.—Ditto a street between the Duncan Road and Trimbeck Purushram Street (do. Rs. 1,661-13-1 do. from do.)	55	0	0
Ditto.—Ditto Koombharwada Street (do. Rs. 3,163-8-8 do. from do.)	133	0	0
5th October 1843.—Ditto cross-street between Lawrence de Lima Street and Moogawur Pakary 4th Row (do. Rs. 855 do. from do.)	32	0	0
3rd April 1844.—Ditto cross-street between Goolam Moidcen Subedar Street and the Duncan Road (do. Rs. 974-15-6 do. from do.)	40	0	0
14th ditto.—Ditto Moonshee Yacoob Street (do. Rs. 763 do. from do.)	25	0	0
23rd September 1844.—Ditto Bengal Poora Street (do. Rs. 1,399 do. from do.)	140	0	0
15th November 1844.—Ditto Temker Street (do. Rs. 4,411-13-4 do. from do.)	215	0	0
14th April 1844.—Improving Borah Musjeed Street (do. Rs. 6-10-6 do. from do.)	1,008	5	0
Carried over.	1,844	2	6

	Rs.	a.	p.
Brought over. .	1,844	2	6
20th February 1845.—Blasting out a large portion of rock which obstructed the course of the Oomercarry Sewer (on which Rs. 7,926 had been previously expended from the County Fund)	306	0	0
6th February and 3rd April 1845.—Making a road and constructing a sewer in Chunam Kiln Row (do. Rs. 1,516 do. from do.) . .	2,068	6	5
3rd June 1845.—Constructing a new road at the back of the Byculla Schools (do. Rs. 1,000 do. from do)	3,841	2	8
11th March 1845.—Ditto 1st Marine Lane	5,138	12	5
Ditto.—Ditto 3rd ditto ditto	4,217	6	10
29th July 1845.—Constructing the approach to Lady Jamsetjee's Causeway	25,574	11	11
30th September 1845.—Improving the drainage of that part of the town which lies between the Erskine Road, Banian Row, Jugjeevan Keeka Street, and the Parell Road, and for constructing three unmade streets in the above localities, with covered drains . .	27,421	13	11
6th November 1845.—Deepening the outer channel of the Love Grove Sluices	1,500	0	0
Ditto.—Ditto and widening the channel from Duncan Road Bridge. .	1,248	2	3
11th ditto.—Building a wall round the northern side of the quarry near the Byculla Tank	1,057	0	0
24th ditto.—Constructing a main sewer from the town drain at Es-lampoora Street, in New Town, along the Bhoolesthwur Road and Shaik Memon Street, to the verge of the Esplanade	35,766	14	7
6th December 1845.—Widening that part of the Warden Road, extending from the foot of Gowalla Tank Hill Road to the carriage road at the Breach	931	14	0
22nd ditto.—Opening Syed Abdool Rahimon Street into Parell Road. .	8,889	12	2
29th ditto.—Widening the Nepean Road, opposite to the ground on the sea side, recently granted to Cursetjee Cowasjee, Esq., and for making cross-drains.	670	8	0
10th January 1846.—Erecting a Grass Market on the Esplanade . .	653	0	0
2nd February 1846.—Arching the sewer in Bapoo Khote Street . .	4,690	4	7
Ditto.—Making an auxiliary drain from the town drain in Copper-smith Row to the sewer in Jugjeevan Keeka Street	1,386	0	0
2nd April 1846.—Erecting a pier on piles over the sea at Boree Bunder, for the use of halalcores	3,952	0	0
12th May 1846.—Raising the Jail Road at the south end of the Baboola Tank, and constructing a covered sewer	1,329	0	0
22nd September 1846.—Constructing a sewer, with cross-drains, and a road, in Chundunwady Lane, from Girgaum Road to Back Bay	11,860	9	3
Ditto.—Constructing a sewer, with cross-drains, and a road in Bhundarwada Road, from the Police Chowkey at Bhundarwada to the Carnac Bunder	6,609	14	8
Carried over. .	1,50,957	8	2

	<i>Rs.</i>	<i>a.</i>	<i>p.</i>
Brought over..	1,50,957	8	2
7th October 1846.—Constructing a main sewer, with cross-drains, in New Line Street, commencing in Lowarchall Street, and discharging into Back Bay near the Pork Market	13,239	4	7
8th ditto.—Widening the Bazar Gate Esplanade Road from 25 to 45 feet	6,053	0	0
26th November 1846.—Constructing six public urinaries, three within the Fort, and three in the Native Town	651	0	0
27th ditto.—Ditto a sewer and cross-drains in Ballajee Shamshet Street	1,539	4	0
28th ditto.—Ditto roadways in six streets situated between Obelisk Road, Erskine Road, Duncan Road, and Parrell Road	16,719	6	3
8th December 1846.—Arching over the town drain, from corner of the Erskine Road to Waddington Bridge	26,490	9	7
8th February 1847.—Constructing a sewer and cross-drains, and making a road in Khutterwady Lane	2,590	12	0
20th September and 12th February 1847.—Removing houses near the Parrell Road	2,750	0	0
13th February 1847.—Widening a part of Medow Street	2,000	0	0
17th ditto.—Constructing station, and three iron tanks on wheels, and digging a cesspool on the side of the town drain	926	1	1
Ditto.—Ditto a public necessary at Cammattee Poora	4,082	12	2
19th March 1847.—Making Koombharwada Street at Dongree, with open side-drains	1,058	12	0
17th July 1847.—Completing Eslampoora Street, in the New Town.	1,031	0	0
18th August 1847.—Draining and improving Wittulwady Street ..	6,246	12	8
26th ditto.—Constructing a sewer in Butcher Street, Nagdew Street, and Musjeed Bunder Cross-road	27,531	14	0
1st October 1847.—Making a main sewer in the centre of the Breachcandy road, and cross-drains from Dhobee Tank to Colbhat Lane.	8,595	11	1
7th December 1847.—Making a covered arched drain, from the north side of English Burying Ground to Old Sonapoor Street, and main sewer and cross-drains in the Old Sonapoor Street; also main sewer and cross-drains in the Breachcandy Road, from Colbhat Lane to Agiary Lane	18,028	8	10
5th January 1848.—Erecting a new Beef Market within the Fort (in Mody Bay Street)	1,192	0	0
20th ditto.—Substituting pavement for plaster work in the bottom of the main sewer in Butcher Street and Musjeed Bunder Cross-road.	662	0	0
Ditto.—Removing and re-making arched main sewer in part of Syed Abdool Rahimon Street, and making cross-drains, and re-making roadway	3,342	10	3
3rd March 1848.—Making a main sewer in Musjeed Bunder Cross-road to the sea-shore at Clare Bunder, also a sewer and cross-drains in part of Cazeer Syed Street	9,012	13	7
Carried over..	3,01,704	15	3

	<i>Rs.</i>	<i>a.</i>	<i>p.</i>
brought over..	3,01,701	15	3
7th March 1848.—Converting the present open side-gutter of 1st Carpenter Street, in the New Town, into covered drains, including the valuation for steps removed	1,218	6	2
3rd April 1848.—Raising, paving, and sloping the sewer in the centre of Syed Abdool Rahimon Street	3,200	4	10
Ditto.—Making a main sewer and cross-drains, with foot-path, &c. from Parell Road to Oomercarry Sewer	1,716	0	0
Ditto.—Ditto an arch over portion of the present open drain in Copersmith Street, and making cross-drains, also re-making a roadway	3,775	2	4
16th May 1848.—Widening the Breachcandy Road, near Dhobee Tank, including valuation of certain buildings to be removed ..	1,099	10	2
18th ditto.—Ditto ditto near New Sonapoor, and value of certain buildings to be removed	3,288	0	11
31st August 1848.—Opening out the street from Khoja Street into the Bhendy Bazar Road, including valuation for buildings to be removed	500	9	2
Ditto.—Making and draining the cross-street between Shaik Abdoola Puckmoria Street, Bhendy Bazar Road, and over the Oomercarry Sewer	774	11	10
9th November 1848.—Ditto a cross-road between Syed Abdool Rahimon Street and Beebee Jan Row	985	0	0
30th ditto.—Constructing a drain from the north side of the Grant College compound	1,551	8	0
9th December 1848.—Making Moogawur Pakary 1st Row, in Mazagon	593	5	7
25th August 1849.—Widening and improving Bhooleshwur Lane	9,665	3	2
27th October 1849.—Making a covered drain, with cross-drains, on the side of the Esplanade Cross-road, and re-making roadway ..	1,562	8	0
Ditto.—Converting the present open side-gutters of Picquet Road into covered drains, and re-making roadway	1,462	0	0
31st December 1849.—Making cross-drains, and re-making roadway in Mirza Oil-maker Street	1,688	0	7
Ditto.—Providing the drainage of the pieces of vacant ground on either side of the cross-road which connects Duncan Road with Trimback Purushram Street.	1,917	8	0
31st June 1850.—Widening, raising, and strengthening the banks of the main town drain.	985	1	3
26th March 1850.—Putting up lamps along the road from the Church Gate to Esplanade Cross-road	531	11	0
8th August 1846.—Opening Bapoo Khote Street	1,237	5	11
22nd September 1846.—Widening the unmade streets between Dongree Cooly Street to old Jamlee Musjeed Street	2,095	8	10
Carried over..	3,14,582	12	0

	<i>Rs.</i>	<i>a.</i>	<i>p.</i>
Brought over..	3,44,582	12	0
<i>New Works, of which Accounts were not closed on 1st May 1851.</i>			
7th November 1848.—Constructing a made road and drain in Guneshwady or Sootatchall Lane	896	7	2
15th December 1848.—Improving, and thoroughly draining the Parell Road from the Esplanade to Jugjeevan Keeka Street ..	46,908	14	10
12th January 1849.—Making cross-drains, and re-making roadway in 2nd Bhoewada Street	1,400	0	0
Ditto.—Substituting covered drains for the open side-gutters of the 1st Bhoewada Street, from the Bhooleshwur Road to Jugjeevan Keeka Street.	1,919	8	0
27th October 1849.—Covering open drain from Bapoo Khote Street to Parell Road, at Poydowney	10,627	5	5
Ditto.—Making a main sewer in the centre, and cross-drains, and re-making a roadway, in Poydowney Street	8,084	12	4
31st December 1849.—Ditto a small portion of Oomercarry Sewer between Duncan and Grant Roads, and re-making roadway over it.	3,950	0	0
Ditto.—Constructing a lane from Old Nagpada Street to 2nd Dontarr Road, or Gora Molla	831	0	0
Ditto.—Making cross-drains, and re-making roadway, in Syed Abdool Rahimon Street	7,277	10	6
20th February 1850.—Abating the nuisances in the rear of Cammattee Poora, and Oomercarry Sewer, between Grant and Bellasis Roads	2,581	9	9
Ditto.—Levelling Nowrojee Hill 1st Row, and making a roadway..	866	12	3
20th February 1850.—Levelling Dontarr 3rd Row	608	8	0
8th March 1850.—Removing the nuisance arising from the present state of public necessary at Sonapoor, and improving the approaches thereto	13,576	3	6
22nd May 1850.—Making a platform for tipping the carts for emptying the night-soil into the sea-channel of the Love Grove Sluices, and constructing a roadway thereto	1,871	13	7
31st ditto.—Deepening the sea-channel of the Love Grove Sluices ..	1,567	9	11
9th July 1850.—Removing a dangerous projection from the west side of the Breachcandy Road, immediately opposite to the Churnam Kiln Row	510	11	2
Ditto.—Raising, levelling, and draining the unmade road traversing the centre of the suburb of Cammattee Poora	2,909	0	0
25th October 1850.—Constructing a new road between the Chowpatty and Breachcandy Roads	12,636	1	9
5th November 1850.—Improving the suburbs of Small Colaba, by levelling roads and making drains	2,784	2	6
Ditto.—Outlay incurred consequent on the alteration made to the new Medical Depôt, to admit of Apollo Street being widened ..	1,445	0	0
Carried over..	4,67,835	14	8

	<i>Rs.</i>	<i>a.</i>	<i>p.</i>
Brought over..	4,67,835	14	8
5th December 1850.—Opening a road from Bhooleshwur Road to • Parell Road, through the Pinjrapole.	6,990	10	7
17th January 1851.—Widening and draining Colbhat Lane . . .	6,454	3	3
29th ditto.—Widening the Chowpatty Road from the Portuguese Church in Girgaum to the foot of Malabar Hill	4,099	1	3
5th February 1851.—Making masonry covered drains on both sides in Ardaseer Dady Street, and re-making roadway.	1,759	0	0
27th ditto.—Cleaning, levelling, and putting into proper order the side-drain of Bellasis Road	818	5	1
30th April 1851.—Leading into the Baboola Tank the monsoon sur- face-drainage of the high ground in its neighbourhood	1,144	0	0
18th August 1851.—Digging sixty-six pits on the Flats for the deposit of night-soil	1,622	0	0
19th ditto.—Covering ditto ditto with bamboo matting, mineral- browned, and supported with rafters	873	1	6
6th March 1851.—Covering over town drain from Waddington Bridge, or junction of Trimbuck Parushram Street with main drain, as far as 200 feet beyond the Bellasis Road	1,42,157	14	1
Ditto.—Sinking and building a well, with platform, at Gowalla Tank	2,505	0	0
16th April 1851.—Constructing a flat masonry bottom to the main drain, from 200 feet below the Bellasis Road Bridge to the wooden bridge across the Flats	9,397	8	0
7th May 1851.—Paving the remaining uncovered portion of the drain from Parell Road to the main drain, on the north side of the Bel- lasis Road, and for covering over the upper portion of it as far as 100 yards below the junction of the Duncan and Bellasis Roads	4,978	4	0
31st May 1851.—Constructing a road from the Grant to the Bellasis Road.	2,013	4	0
13th March 1850.—Macadamizing and draining Tellowdy or Wittulwady Cross-street (of the cost of this work, Rs. 2,475, Rs. 1,605 are to be borne by the inhabitants, for draining, and the other portion, for macadamizing, by the Municipal Fund)	766	7	6
2nd March 1852.—Improving the Koombharwada Road from Duncan Road to Waddington Bridge, and raising roadway	1,324	2	9
31st ditto.—Digging forty-nine pits on the Flats, each 30 feet long, 12 feet broad, and 10 feet deep, for the deposit of night-soil . . .	1,433	14	9
Ditto.—Covering ditto with bamboo matting, mineral-browned, and supported on rafters.	712	8	8
2nd November 1850, and 2nd August 1851.—Planting and fixing a single row of trees on each side of the Esplanade Road, from Kalbadavee Road to Apollo Gate	1,551	8	0
Carried over..	6,58,436	12	1

	<i>Rs.</i>	<i>a.</i>	<i>p.</i>
Brought over .	6,58,436	12	1
14th December 1850.—Constructing the apparatus, including pipes, for the conveyance of the water of the Framjee Cowasjee Tank to the centre of the Native Town at Poydowney	20,000	0	0
6th March 1851.—Sinking and building a tank, with platform, &c. at Girgaum Back Road	3,517	0	0
Ditto.—Sinking and building a well, with platform, &c. on the side of the Khetwady Road	2,866	0	0
17th ditto.—Enlarging and deepening the present well in Wittulwady Street	1,658	0	0
14th May 1851.—Sinking and building a well, with platform, &c. in Colaba, near the Gun Carriage compound	1,822	0	0
31st ditto.—Purchasing and improving a quarry of sweet water, situated in Nanabhoy Jamsetjee's ground at Mazagon	2,000	0	0
22nd September 1851.—Sinking and building a well in Parell	1,599	2	2
26th December 1851.—Sinking and building a well in Sewree	1,467	0	0
15th February 1853.—Constructing a well in Candawady Lane	625	8	2
23rd ditto.—Ditto ditto near Bazar gate	1,366	14	3
8th January 1852.—Making a road from the town drain to Tardeo	3,790	8	0
15th May 1852.—Raising and levelling a thoroughfare, running by the sea-side, between the road close to the Portuguese Chapel and the road to the Lunatic Asylum	503	4	1
26th May and 9th July 1852.—Forming a new burial ground on the Bombay Flats	4,040	12	10
13th July 1852.—Widening Colaba Causeway	7,301	14	10
30th July 1851.—Lighting the road from the Bazar Gate to Shaik Memon Street by a single row of lamps	557	14	2
31st December 1853.—Completing the drainage of the undermentioned eighty-seven streets and lanes, situated in the Mandwee, Market, and Oomercarry sub-divisions of the Native Town	40,000	0	0
Shaik Memon Street.			
Shaik Ally Jungeerkur Row.			
Esplanade Cross-road.			
Balloo Surung Street.			
Bhajee Palla Row.			
Nagdew Row.			
Narron Dhooroo Street, and cross-street from Narron Dhooroo Street to Syed Abdool Rahimon Street.			
Cross-street from Narron Dhooroo Street to Nagdew Street.			
Dhunjee Dongria Lane, Agiary Lane, and cross-street.			
Moombadavee Tank Road.			
Beebee Jan Row.			
Coppersmith Street.			
Nagdew Street.			
Hussan Khan Khalifa Row.			
Carried over .	7,51,552	10	7

	<i>Rs.</i>	<i>a.</i>	<i>p.</i>
Brought over. .	7,51,552	10	7

Old Caze Street.

Jamblee Musjeed Street.

Unmade cross-streets from Esplanade Cross-road to Shaik Ally Jungeerkur Street.

Cross-street from Shaik Ally Jungeerkur Street to Bhundarwada Street.

Cross-street from Jamblee Musjeed Street to Dongree Cooly Street.

Bhaje Palla Row.

Memonwada Street.

Cross-street from 1st Koombharwada Street to Memonwada Street.

Beebee Jan Row.

Unmade cross-street from 1st Koombharwada Street to Memonwada Street.

Nagdew Row.

1st Koombharwada Street.

2nd ditto ditto.

Shaik Ally Jungeerkur Row.

Esplanade Cross-road.

Dongree Joao Souza Street.

Duriastan or Chambarwada Street, and branch to Dongree Joao Souza Street.

Shamjee Hassajee Street and Bhundarwada Street.

Unmade cross-street from Shaik Ally Jungeerkur Row to Shamjee Hassajee Street.

Essajee Hassajee Street.

Unmade cross-street from Bhundarwada Street to Essajee Hassajee Street.

Musjeed Bunder Row.

Kaze Syed Street.

Unmade cross-street from Caze Syed Street to Dongree Cooly Street.

Dongree Cooly Street.

Mahomed Syed Mookke Street.

Memonwada Street, and cross-street from Memonwada to Nagdew Street.

Mahomed Hussein Kambakur Street.

Dontarr 2nd Row.

Dontarr 3rd Row.

Cross-street from Shamjee Hassajee Street to Dontarr 3rd Row, and from Chambarwada Street to cross-street.

Unmade cross-streets between Dontarr 3rd Row and Shamjee Hassajee Street, and from Musjeed Bunder Cross-road to cross-street.

Shamjee Hassajee Street.

Carried over. .	7,51,552	10	7
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	<i>Rs.</i>	<i>a.</i>	<i>p.</i>
Brought over. .	7,51,552	10	7
Poydowney Street, Combed Bowel Street, and Chambarwada Street,			
Dongree Cooly Street.			
Dongree Cooly Cross-Street.			
Shamjee Hassajee Street.			
Street from Chinch Bunder 1st Row to Chambarwada Street.			
Combed Bowel Street.			
Dontarr 1st Row.			
Dontarr 2nd Row.			
Memonwada Street.			
Nagdew Street.			
Chunam Kiln Row.			
Chinch Bunder 3rd Row.			
Chinch Bunder 2nd Row.			
Nishandar Oomercarry Row.			
Cross-street from Chinch Bunder 1st Row to Nishandar Oomercarry Row.			
Foogla Tandel Street.			
Nishandarnicha Pada.			
Cross-street from Nishandar Oomercarry Row to Jail 2nd Row.			
Cross-street from Chinch Bunder 2nd Row to Bengalpoora Oomercarry Row.			
Market Lane.			
Bengalpoora Oomercarry Row.			
Jail 2nd Row.			
Old Nagpada Cross-street.			
Dontarr 1st Row.			
Dontarr 2nd Row.			
Old Nagpada Street.			
Gora Molla.			
Cross-street from Gora Molla and Old Nagpada Street.			
Cross-street from Old Nagpada Street to main sewer underneath the house at Parell Road.			
Cross-street behind the Byculla Schools.			
Continuation of Chunam Kiln sewer to Parell Road footpath.			
Cross-street from Foogla Tandel Street to Dontarr 2nd Row.			
Jail Row.			
1 hundred petty works* under the cost of Rs. 500 were also executed during the last eight years, at the cost of	47,437	13	11
Carried over. .	7,98,990	8	6

* For particulars of these petty works, see Appendices B, C, and F, of the Board's Report to Government for the first half of 1845-46 (*Government Gazette*, 6th January 1846); Appendices B, C, D, G, I, and K, of similar Report for second half of 1845-46 (*Government Gazette*, 11th August 1846); Appendices D, G, J, K, M, and N, in the Board's Report 1846-47 (*Government Gazette*, 2nd September 1847); Appendices H, K, L, N, and O, in the Board's Report 1847-48 (*Government*

Rs. a. p.
Brought over. . 7,98,990 8 6

Portions of various roads and streets were widened, by the retirement of 63 houses under building certificates, for the year 1845-46, at the cost of Rs. 4,155 5 10

Ditto ditto of 112 ditto, for 1846-47, ditto ..	9,836	4	3
Ditto ditto of 55 ditto, for 1847-48, ditto ..	3,639	13	6
Ditto ditto of 113 ditto, for 1848-49, ditto ..	5,140	7	11
Ditto ditto of 61 ditto, for 1849-50, ditto ..	7,792	9	1
Ditto ditto of 51 ditto, for 1850-51, ditto ..	6,774	5	2
Ditto ditto of ditto, for 1851-52, ditto ..	5,616	15	9
Ditto ditto of ditto, for 1852-53, ditto ..	4,534	1	7

47,489 12 1

The sum expended during the year 1845-46, on account of paving and improving the drainage of certain gullies, was Rs. 17,119 0 5

Ditto ditto 1846-47, ditto ditto ..	3,154	6	7
Ditto ditto 1847-48, ditto ditto ..	2,258	11	1
Ditto ditto 1848-49, ditto ditto ..	1,882	15	10
Ditto ditto 1849-50, ditto ditto ..	2,460	15	11
Ditto ditto 1850-51, ditto ditto ..	1,686	8	2
Ditto ditto 1851-52, ditto ditto ..	1,633	3	7
Ditto ditto 1852-53, ditto ditto ..	1,625	0	0

32,120 13 7

For repairing and watering the roads and streets, for the year 1845-46 Rs. 55,008 1 4

Ditto ditto, 1846-47 ..	73,414	11	1
Ditto ditto, 1847-48 ..	76,611	7	7
Ditto ditto, 1848-49 ..	95,607	5	10
Ditto ditto, 1849-50 ..	79,290	4	6
Ditto ditto, 1850-51 ..	73,889	3	10
Ditto ditto, 1851-52 ..	77,500	0	0
Ditto ditto, 1852-53 ..	87,210	3	6

6,18,531 5 8

For scavenging the town, and repairing and cleaning drains, for the year 1845-46 Rs. 23,092 1 4

Ditto ditto, 1846-47 ..	40,342	5	2
Ditto ditto, 1847-48 ..	38,681	8	6
Ditto ditto, 1848-49 ..	35,000	0	0

Carried over. . 1,37,115 15 0 14,97,132 7 10

Gazette, 10th September 1848); Appendix B to the Board's Report 1848-49 (*Government Gazette*, 18th October 1849); Appendix B of similar Report for 1849-50 (*Government Gazette*, 10th September 1850); Appendix B of ditto for 1850-51 (*Government Gazette*, 13th November 1851); Appendix B of ditto for 1851-52 (*Government Gazette*, 5th May 1853); Appendix B of ditto for 1852-53 (*Government Gazette*, 25th May 1854).

				Rs. a. p.		
Brought over. .				Rs. 1,37,115	15 0	11,97,132 7 10
For scavenging the town, and repairing and cleaning drains, for the year 1819-50.						
	Ditto	ditto,	1850-51	35,000	0 0	
	Ditto	ditto,	1851-52	37,166	10 8	
	Ditto	ditto,	1851-52	41,500	0 0	
	Ditto	ditto,	1852-53.	41,500	0 0	
				<hr/>		
				2,92,282 9 8		
Annual repairs to public works, for the year						
1845-46.				Rs. 706	8 7	
	Ditto	ditto,	1846-47	1,512	6 4	
	Ditto	ditto,	1847-48	1,728	2 4	
	Ditto	ditto,	1848-49	5,172	2 1	
	Ditto	ditto,	1849-50	3,312	7 0	
	Ditto	ditto,	1850-51	4,808	12 0	
	Ditto	ditto,	1851-52	3,126	0 3	
	Ditto	ditto,	1852-53	3,315	15 4	
				<hr/>		
				23,742 5 11		
Annual repairs to public tanks and wells, for the year 1845-46						
	Ditto	ditto,	1846-47	Rs. 3,127	1 8	
	Ditto	ditto,	1846-47	5,690	14 0	
	Ditto	ditto,	1847-48	896	7 5	
	Ditto	ditto,	1848-49	1,290	5 7	
	Ditto	ditto,	1849-50	2,425	3 8	
	Ditto	ditto,	1850-51	1,915	3 3	
	Ditto	ditto,	1851-52	30,912	12 5	
	Ditto	ditto,	1852-53	7,192	5 9	
				<hr/>		
				53,480 5 9		
Lighting, for the year 1845-46						
	Ditto	ditto	1846-47	Rs. 46	12 4	
	Ditto	ditto	1846-47	419	15 10	
	Ditto	ditto	1847-48	255	7 10	
	Ditto	ditto	1848-49	227	7 6	
	Ditto	ditto	1849-50	193	3 6	
	Ditto	ditto	1850-51	175	1 7	
	Ditto	ditto	1851-52 . . . . .	.....	
	Ditto	ditto	1852-53 . . . . .	.....	
				<hr/>		
				1,318 3 7		
Removing cudjans, &c. from the houses in Native Town, for the year 1845-46						
	Ditto	ditto	1846-47	Rs. 46	15 0	
	Ditto	ditto	1846-47	151	4 8	
	Ditto	ditto	1847-48	82	10 0	
	Ditto	ditto	1848-49	67	15 9	
	Ditto	ditto	1849-50	111	8 0	
	Ditto	ditto	1850-51	158	2 0	
	Ditto	ditto	1851-52	598	11 2	
	Ditto	ditto	1852-53	720	1 2	
				<hr/>		
				1,937 3 9		
Carried over. .				18,69,893	4 6	

				<i>Rs. a. p.</i>		
				Brought over	18,69,893	4 6
Work done departmentally, for the year 1845-46*				Rs. 652	6	0
• Ditto	ditto,	ditto	1846-47 ..	....	
Ditto	ditto,	ditto	1847-48 .	558	1	11
Ditto	ditto,	ditto	1848-49 ..	2,020	9	5
Ditto	ditto,	ditto	1849-50 ..	2,529	4	1
Ditto	ditto,	ditto	1850-51 ..	2,931	10	0
Ditto	ditto,	ditto	1851-52 ..	252	0	0
Ditto	ditto,	ditto	1852-53 .	231	0	0
					9,174	9 5
Total. . .				Rs. 18,79,067	13	11

2ND.

Mode in which such Works are let to Contract.

The plans and estimates of all new works are in the first instance approved by the Board and Bench, and forwarded to Government for sanction. On the sanction of Government being received, an advertisement is inserted in the *Government Gazette*, to the effect that verbal tenders for their execution will be received, on the day and hour specified, at the office of the Superintendent of Repairs, where the plans and estimates will remain for public inspection during the interim.

At the time fixed, there is generally an attendance of about 20 contractors. The work is then put to Dutch auction, at the amount of the engineer's estimate, and is ultimately knocked down to the lowest bidder. The names of all the competing parties, and the amount of the three lowest tenders, is taken down in the office records, a copy of such record (in the annexed form) being forwarded to the Board, with a recommendation that the contract should be given to the lowest bidder (if unobjectionable,) and on the confirmation of the Board being received the work is commenced.

* For particulars of the works done departmentally, see Appendix A of the Board's Report to Government for 1845-46 (*Government Gazette*, 11th August 1846); Appendix A of similar Report for 1847-48 (*Government Gazette*, 19th September 1848); Appendix A of similar Report for 1848-49 (*Government Gazette*, 18th October 1849); Appendix F of similar Report for 1849-50 (*Government Gazette*, 19th September 1850); Appendix E of ditto for 1850-51 (*Government Gazette*, 13th November 1851); Appendix F of ditto for 1851-52 (*Government Gazette*, 5th May 1853); Appendix F of ditto for 1852-53 (*Government Gazette*, 25th May 1854).

Rates at which they are estimated, and have been executed.

Works sold in Superintendent of Repairs' Office on the 15th February 1851. (Form of Office Contract Register.)

Date of Sale.	Names of the Contractors present.	Description of Works.	Amount of Estimates without Contingencies.	Amount of lowest Tenders.	Names of three lowest Bidders.	To be completed by
			<i>Rs. a. p.</i>	<i>Rs. a. p.</i>		
1851 Feb. 15.	Jansejee Dorabjee; Bomanjee Jansejee; Martund Bajee; Sorabjee Cursejee; Pestonjee Rustonjee; Jhangveer Kakharoo; Rustonjee Ruttonjee; Rutton Khan; Jairam Yadavjee; Gungaram Ramjee; Ragoo Woolajee; Dhaniboo Wittul; Pandoo Simbajee; Madoo Hurjee; Tookaram Hurjee; Bapoo Amecadin; Nilajee Poot-lajee; Pestonjee Pallonjee; Govind Callojee; Cursetjee Rustonjee; Anzad Punduchee; Shaik Babun; Hockajee Ningoo; Dhondoo Narayan; Babajee Ramjee; Elsette Nursoo; Sayajee Goonajee.	Opening a road from Bhodolshwar Road to Parrell Road through the Pujapade (as verised in the <i>Gazette of the 15th February 1851</i> , page 235).	2,636 0 4	1,175 0	0 Dhondoo Wittul and 31st May 1851. Ramjee Dajeeba. Gungaram. 0 Ramjee Dajeeba.	
		Making masonry covered drains on both sides in Ardaseer Dady Street (advertised in the <i>Go vernment Gazette of the 13th February 1851</i> , page 235).	3,032 0 9	1,375 0 1,400 0 1,425 0	0 Gungaram Ramjee. 0 Tookaram Hurjee. 0 Gungaram Ramjee.	30th April 1851.
		Sinking and building a well, with platform, at Gowalla Tank.	2,307 10 7	1,250 0 1,300 0 1,325 0	0 Dhondoo Narayan. 0 Jamsetjee Dorabjee. 0 Bomanjee Jansejee.	15th April 1851.

LOCAL RATES FOR MASONRY, EARTHWORK, &c.

Schedule of Railway Contract Rates.

Items.	Contract No. 1. From Benabai to Tana, (Messrs. Fryer and Fowles.)			Contract No. 2. Line from Chik- dale to Persek Point, (Mr. J. Jackson.)			Contract No. 3. From Persek Point to Cullion, (Jam- sing Dorahjee.)			Contract No. 4. Line from Cullion to Washidree, (Jam- sing Dorahjee.)		
	Rs.	s.	d.	Rs.	s.	d.	Rs.	a.	p.	Rs.	a.	p.
Average price of earthwork deposited in embankment, per cubic yard . . .	0	0	8 $\frac{1}{4}$	0	0	9 $\frac{1}{2}$	0	4	6	0	6	6
Earthwork deposited in embankment No. 1, per cubic yard . . .	...	...	...	0	1	4	...	...	...	...	...	...
Earthwork deposited in embankment, when the length of lead does exceed $\frac{1}{4}$ of a mile, per cubic yard . . .	0	0	10	0	0	9 $\frac{1}{2}$	0	4	0	0	4	0
Ditto $\frac{1}{2}$ ditto ditto . . .	0	1	0	0	0	11 $\frac{1}{2}$	0	6	0	0	6	0
Ditto $\frac{3}{4}$ ditto ditto . . .	0	1	4	0	1	1 $\frac{1}{2}$	0	8	0	0	8	0
Ditto ditto ditto . . .	0	1	8	0	1	3 $\frac{1}{2}$	0	10	0	0	10	0
Ditto ditto ditto . . .	0	2	0	0	1	5 $\frac{1}{2}$	0	11	0	0	11	0
Ditto ditto ditto . . .	0	2	0	0	1	7 $\frac{1}{2}$	0	12	0	0	13	0
Ditto ditto ditto . . .	0	2	4	0	1	9 $\frac{1}{2}$	0	13	0	0	13	0
Ditto ditto ditto . . .	0	2	6	0	1	11 $\frac{1}{2}$	0	14	0	0	14	0
Ditto ditto ditto . . .	0	0	4	0	0	2	...	...	...	...	...	...
For every additional quarter of a mile, ditto . . .	...	...	...	...	...	...	...	...	...	...	...	...
Earthwork deposited in embankment from rock cutting, when the length of lead does not exceed $\frac{1}{4}$ of a mile, per cubic yard . . .	...	...	...	...	...	...	0	5	0	0	5	0
Ditto ditto ditto . . .	...	...	...	...	...	...	0	7	6	0	7	6
Ditto ditto ditto . . .	...	...	...	...	...	...	0	10	0	0	10	0

Items.	Contract No. 1. From Bombay to Tanna. (Messrs. Favell and Fowler.)			Contract No. 2. Line from Chen- dance to Perseck Point. (Mr. J. Jackson.)			Contract No. 3. From Perseck Point to Cullian. (Jan- setjee Dorajjee.)			Contract No. 4. Line from Cullian to Wessandee. (Jan- setjee Dorajjee.)		
	£	s.	d.	£	s.	d.	Rs.	a.	p.	Rs.	a.	p.
Earthwork deposited in embankment from rock cutting, when the length of lead does not exceed 1 mile, per cubic yard ..												
Ditto ditto 1½ ditto ditto ..							0	12	6	0	12	6
Ditto ditto 1½ ditto ditto ..							0	13	9	0	13	9
Ditto ditto 1½ ditto ditto ..							0	15	0	0	15	0
Ditto ditto 1½ ditto ditto ..							1	0	3	1	3	0
Ditto ditto 2 ditto ditto ..							1	1	6	1	6	0
For every additional quarter of a mile, ditto ..							0	1	0	0	2	0
Side-cutting lead, not exceeding 100 yards, ditto ..	0	0	9	0	0	9	0	4	0	0	6	0
Side-cutting from trenches, ditto ..							0	5	0	0	5	0
Trimming slopes of cuttings and embankments, per square yard ..	0	0	0½	0	0	0½	0	0	4	0	1	0
Stone-pitching on slopes, 12 inches thick, ditto ..	0	6	0	0	1	0	0	5	0	0	8	0
Soiling slopes ..	0	0	0½	0	0	0½	0	0	4	.....	.....	.....
Stone-pitching in inverts, 12 inches thick, per square yard ..							1	0	0	1	0	0
Excavation of foundations of bridges and culvert in rock, per cubic yard ..												
Ditto .. ditto .. in masonry, ditto ..							.....	.....	.....	3	0	0
Concrete ..	0	0	9	0	0	9	0	6	0	0	12	0
Brickwork in piers, abutments, &c. per cubic yard ..	0	10	0	0	6	0	2	4	0	2	8	0
Ditto in arch in viaduct, ..	0	13	0	0	16	0	6	0	0	7	8	0
Ditto ditto in bridges, ..							.....	.....	.....	15	0	6
Ditto in culverts, ..	0	16	0	1	0	0	7	8	0	12	0	0
Block in course masonry, ..	0	15	0				7	8	0	10	0	0
Coursed rubble masonry, ..							8	0	0	14	0	0
Rubble masonry in bridges, ..							.....	.....	.....	10	0	0
Rubble masonry in walls and blocking, ditto ..							6	0	0	7	0	0
Rubble masonry, with block and course page work, in piers, abutments, &c. of blocking course, per cubic yard ..	0	12	0	0	10	0	4	0	0	7	0	0
	1	2	0	0	18	0	.....	.....	.....	.....	.....	.....

Day rubble walling, ditto	..	..	..	0	8	0	0	6	6	2	12	0	5	0	0
Aslar in string course, &c. per cubic foot	..	..	..	0	2	6	0	0	2	0	14	0	1	4	0
Aslar springers and arch quoins, ditto	..	..	..	..	..	..	..	..	..	13	0	0	1	4	0
Post and rail fencing, fixed, complete, per lineal yard	..	..	..	0	2	0	0	1	0	11	3	0	0	11	0
Prickly-pear fencing, and mound	..	..	..	0	0	3	0	0	2	0	0	9	0	1	0
Wrought-iron in bolts, washers, per cwt.	..	..	..	2	0	0	2	0	0	19	0	0	20	0	0
Pile-driving, including rings and shoes, per lineal foot.	..	..	..	0	2	0	0	2	0	14	0	0	1	0	0
Timber for piles, 15 feet long, per cubic foot	..	..	..	0	3	6	0	2	6	1	0	0	2	0	0
Ditto 20 ditto	..	..	..	0	3	9	0	3	0	1	4	0	2	0	0
Southern teak, in girders, joists, &c. per cubic foot	..	..	..	0	4	6	0	4	6	2	0	0	2	8	0
Ditto, 2-inch planking, per square foot	..	..	..	0	5	0	0	4	0	2	0	0	0	10	0
Khair, in blocks, joists, posts, &c. ditto	..	..	..	0	3	0	0	3	0	1	0	0	1	0	0
One pair of gates, with posts, set, complete, including the coats of paint, as per specification and drawing, for 15 feet roadway	..	..	..	20	0	0	20	0	0	150	0	0	130	0	0
One pair of gates, 20 feet roadway	..	..	..	50	0	0	40	0	0	275	0	0	200	0	0
Ditto ditto, 50 ditto	..	..	..	100	0	0	45	0	0	..	..	..	..	..	..
Wicket gate, set, complete	..	..	..	5	0	0	3	0	0	50	0	0	50	0	0
Metalling for road, 6 inches thick, per square yard	..	..	..	0	2	6	0	1	0	0	8	0	0	8	0
Clay puddle for bridges, per cubic yard	..	..	..	0	2	6	0	1	6	0	12	0	0	12	0
Ballast for permanent road, provided and spread, per ditto	..	..	..	0	1	2	0	1	9	0	10	0	0	10	0
Ditto ditto on siding and stations	..	..	..	0	2	3	..	..	..	..	..	..	..	..	..
Laying single line of permanent way, including keys, per lineal yard	..	..	..	..	..	..	0	1	9	1	0	0	1	4	0
Ditto double ditto	..	..	..	0	4	0	..	..	..	..	..	..	..	..	..
Laying a single crossing, per ditto	..	..	..	0	5	0	0	5	0	2	4	0	2	4	0
Cast-iron girders, fixed, complete	..	..	..	..	..	..	12	0	0	..	..	..	..	..	..
Laying one set of points, ditto	..	..	..	0	6	0	..	..	..	2	0	0	2	0	0
Ditto ditto, each	..	..	..	..	..	..	2	10	0	..	..	..	..	..	..
Laying a complete through crossing, per lineal yard	..	..	..	0	6	0	0	5	0	2	4	0	2	4	0
Keys, per 1000	..	..	..	10	0	0	8	0	0	..	..	..	..	..	..
Leading rails, chairs, pins, and other materials, including loading and unloading, per ton per mile	..	..	..	0	1	0	0	1	0	..	..	..	..	..	..
Loading sleepers, per 100 per mile	..	..	..	0	5	0	0	10	0	..	..	..	..	..	..
<i>Wages.</i>															
Wages for excavators, per day	..	..	..	0	1	4	0	0	8	0	4	0	0	3	0
Backlayers, ditto	..	..	..	0	8	0	0	1	3	0	8	0	0	8	0

Items.	Contract No. 1. From Bombay to Tanna. (Messrs. Favell and Fowler.)		Contract No. 2. Line from Chien- danee to Per-seek Point. (Mr. J. Jackson.)		Contract No. 3. From Per-seek Point to Callian. (Jam- see Dorabjee.)		Contract No. 4. Line from Callian to Wasindree. (Jam- see Dorabjee.)	
	£	s. d.	£	s. d.	Rs.	a. p.	Rs.	a. p.
Masons, per day ..	0	2 6	0	1 3	0	10 0	0	8 0
Carpenters, ditto ..	0	3 0	0	1 3	0	8 0	0	10 0
Smiths, ditto ..	0	3 6	0	1 6	0	12 0	1	0 0
Plate-layers (Europeans), per day ..	0	7 0	0	6 0	0	5 0	8	0 0
Labourers, ditto ..	0	1 0	0	0 8	0	3 0	0	3 0
Cart and pair of bullocks, ditto ..	0	2 0	0	2 0	1	0 0	1	0 0
12-inch drain, per lineal yard ..	0	7 0	0	8 0	2	0 0	3	0 0
18-inch ditto, ditto ..	0	8 0	0	10 0	3	0 0	5	0 0
24-inch ditto, ditto ..	0	10 0	0	15 0	4	14 0	8	0 0
30-inch ditto, ditto ..	0	18 0	1	1 0	8	0 0	12	0 0
3-feet culvert, ditto ..	2	10 0	1	10 0	15	0 0	15	0 0
4-feet ditto, ditto ..	4	0 0	3	3 0	..	..	..	..
6-feet ditto, ditto ..	8	0 0	6	10 0	40	0 0	30	0 0
Double 2-feet culvert, ditto ..	1	10 0	1	10 0	15	0 0	20	0 0
Ditto 2-feet 6-inch do. ditto ..	2	10 0	1	17 6	18	12 0	20	0 0
Treble 2-feet 6-inch do. ditto ..	..	..	..	..	..	..	30	0 0
Double 4-feet culvert, ditto ..	9	0 0	6	0 0	60	0 0	70	0 0
Paving at lineal crossing, per square yard ..	0	5 0	0	5 0	2	0 0	3	0 0
Painting (3 coats), ditto ..	0	1 0	0	1 0	0	6 0	0	10 0
Tarring (2 coats), ditto ..	0	0 9	0	0 6	0	3 0	0	8 0
Damner (2 coats), ditto ..	0	0 9	0	0 9	0	5 0	0	6 0
Adzing sleepers, per 100 ..	0	18 0	0	10 0	..	..	..	..
Cost of occupation level crossing (as per schedule of quantities), each ..	..	..	15	0 0	125	0 0	150	0 0
Rubble boundary wall (Drawing No. 13), per cubic yard ..	0	14 0	..	..	..	..	..	..
Palisade fencing (Drawing No. 13), per lineal yard ..	0	5 0	..	..	..	..	..	..

Office Rates of the Superintendent of Repairs' Department.

Principal Descriptions of Works executed by the Superintendent of Repairs' Department.	No. 1. Office Estimated Rate per 100 cubic feet.		
	Rs.	a.	p.
Excavation for foundation or for drains, in earth	0	8	0
Ditto ditto ditto, in soft moorum.. ..	0	12	0
Ditto ditto ditto, in hard ditto	2	0	0
Ditto ditto ditto, in soft rock	3	0	0
Ditto ditto ditto, in solid ditto	6	0	0
Filling in foundation with rubble masonry	10	0	0
Rubble masonry superstructure, under 10 feet high	11	0	0
Block in course, with rubble masonry backing, like Byeulla and Maza- gon railway bridges	35	0	0
Cut-stone facing, middle dressed, per 100 square feet	41	0	0
Brick arching, exclusive of centering	27	0	0
Ditto with mud centering	30	0	0
Plastering, chunam, per 100 square feet	4	8	0
Ditto polished, and on curvilinear surface	6	0	0
Coping stone, rough dressed, per cubic foot	0	10	0
Slab-stones for covering small drains, 2 feet by 1 foot, by 5 inches thick, each	0	5	0
Ditto ditto ditto, 3 feet by 1 foot, by 5 inches thick, each ..	0	8	0
Ditto ditto ditto, 4 feet by 1 foot, by 5 inches thick, each ..	0	12	0
Pavement Porebunder stone on rubble masonry, 1 foot thick, per 100 square feet	30	0	0
Ditto blue stone, rough dressed, in rubble masonry foundation ..	1	8	0
Ditto ditto, middle dressed	2	3	0
Ditto chunam terrace floor	9	0	0
<i>Road-making.</i>			
Raising embankment up to the height of 5 feet from side cutting. ..	0	10	4
Ditto ditto, to ditto within $\frac{1}{4}$ mile lead	0	15	0
Dry stone retaining wall	2	6	0
Raising and levelling ground for roadway of not more than a foot in mean height	1	0	0
Khandkies, hammer dressed, for kerbstone, 1 foot square, $1\frac{1}{4}$ feet long, per 100 khandkies	13	0	0
Rough stone kerbstone (undressed)	6	0	0
Paved side water-table for town roads, 1 foot wide, per 100 running feet.	20	0	0
Slabstone for sink, 2 by $1\frac{1}{4}$, perforated with 5 holes	1	8	0
Broken stone, for metalling $1\frac{1}{2}$ inches thick, per 100 square feet, laying and rolling included	0	12	6
Ditto ditto 2 inches ditto ditto ditto	1	0	9
Ditto ditto 3 ditto ditto ditto	1	9	0
Ditto ditto 4 ditto ditto ditto	2	1	3
Ditto ditto 6 ditto ditto ditto	3	2	0
Sand-stone, $\frac{1}{2}$ inch thick, laying and rolling, per 100 square feet. ..	0	12	0
Ditto 1 inch thick, ditto ditto ditto	1	0	0

Rates of the Estimate, and of the lowest Tenders for the filling in of Mody Bay, on the Sea-face of the Fort of Bombay.

[The work consisted of a Sea-wall about 22 feet in height, and filling in behind; the total estimated cost being about £ 70,000.]

(GARRISON ENGINEER AND CIVIL ARCHITECT.)

Items.	Quantity.	Rate,	Per	Amount.
		<i>Rs. a. p.</i>		<i>Rs. a. p.</i>
Excavation for foundation of sea-wall within, at, or nearly at low-water mark.....	163,532	2 0 0	100 cub. ft.	3,270 10 0
Rubble masonry in foundation of sea-wall	112,817	19 0 0	Do.	27,135 3 8
Khandkee facing in foundation of sea-wall	12,435	50 0 0	100 sq. ft.	6,217 8 0
Squared stone-cap of foundation of sea-wall	4,145	200 0 0	100 rg. ft.	8,290 0 0
Rubble masonry in sea-wall	465,632	19 0 0	100 cub. ft.	88,470 12 3
Khandkee facing in sea-wall	81,539	75 0 0	100 sq. ft.	61,154 4 0
Dove-tailed coping stone of the sea-wall	4,145	275 0 0	100 rg. ft.	11,398 12 0
Rubble masonry in walls at any spot within the sea-wall.....	74,974	16 0 0	100 cub. ft.	11,995 13 5
Brick masonry arch-work	9,761	30 0 0	Do.	2,928 4 9
Chunam plaster, $\frac{3}{4}$ inch thick.....	3,397	4 8 0	100 sq. ft.	152 0 0
Filling in of sand or earth.....	24,013,613	2 8 0	100 cub. ft.	6,00,340 5 2
Total.....	.....	.....	..... Rs.	8,21,354 7 3

(PEERKHAN LANDKHAN and SAYBOO NURSOO.)

Items.	Quantity.	Rate.	Per	Amount.
		<i>Rs. a. p.</i>		<i>Rs. a. p.</i>
Excavation for foundation of sea-wall within, at, or nearly at low-water mark...	163,532	1 14 0	100 cub. ft.	3,066 3 7
Rubble masonry in foundation of sea-wall	142,817	17 0 0	Do.	24,278 14 2
Khandkee facing in foundation of sea-wall	12,435	48 0 0	100 sq. ft.	5,968 12 9
Squared stone-cap of foundation of sea-wall	4,145	175 0 0	100 rg. ft.	7,253 12 0
Rubble masonry in sea-wall	465,632	17 0 0	100 cub. ft.	*79,157 7 0
Khandkee facing in sea-wall	81,539	65 0 0	100 sq. ft.	53,000 0 0
Dove-tailed coping stone of the sea-wall	4,145	250 0 0	100 rg. ft.	10,362 8 0
Rubble masonry in walls at any spot within the sea-wall.....	74,974	15 0 0	100 cub. ft.	11,246 1 7
Brick masonry arch-work	9,761	28 0 0	Do.	2,733 1 3
Chuanam plaster, $\frac{3}{4}$ inch thick.....	3,397	4 4 0	100 sq. ft.	144 5 11
Filling in of sand or earth.....	24,013,613	2 2 0	100 cub. ft.	5,10,289 4 5
Total.....	.....	.....	..... Rs.	7,07,500 0 0

(ELSETTE NURSOO and RAJUNNA CRUSTNAJEE.)

Items.	Quantity.	Rate.	Per	Amount.
		<i>Rs. a. p.</i>		<i>Rs. a. p.</i>
Excavation for foundation of sea-wall within, at, or nearly at low-water mark	163,532	2 4 0	100 cub. ft.	3,679 7 6
Rubble masonry in foundation of sea-wall	142,817	15 0 0	Do.	21,422 8 9
Khandkee facing in foundation of sea-wall	12,435	45 8 0	100 sq. ft.	5,657 11 9
Squared stone-cap of foundation of sea-wall	4,145	180 0 0	100 rg. ft.	7,461 0 0
Rubble masonry in sea-wall	465,632	17 0 0	100 cub. ft.	79,157 7 0
Khandkee facing in sea-wall	81,539	70 0 0	100 sq. ft.	57,077 4 9
Dove-tailed coping stone of the sea-wall	4,145	260 0 0	100 rg. ft.	10,777 0 0
Rubble masonry in walls at any spot within the sea-wall	74,971	14 0 0	100 cub. ft.	10,496 5 9
Brick masonry arch-work	9,761	32 0 0	Do.	3,123 8 3
Chunam plaster, $\frac{3}{4}$ inch thick	3,397	5 0 0	100 sq. ft.	169 13 7
Filling in of sand or earth	24,013,613	2 2 0	100 cub. ft.	5,10,289 4 5
Total .....	.....	.....	..... Rs.	7,09,311 10 9

(Signed) J. J. F. CRUICKSHANK, Captain,
Garrison Engineer, and Civil Architect, Presidency.

FINANCIAL DEPARTMENT (*Railway Branch*),
Garrison Engineer and Civil Architect's Office,
Bombay, 10th March 1854.

Rates at which Bungalows are constructed on Malabar Hill.

Foundation digging	Rs.	0	10	0	per 100 cub. ft.
Ditto filling in with material, and labour inclusive	11	0	0	„	„
Ditto ditto ditto, with stone close by ..	12	0	0	„	„
Ditto ditto ditto, if stone from a distance.	13	0	0	„	„
Off-set wall above foundation	13	0	0	„	„
Filling in with earth and stone	1	0	0	„	„
Wall, with material, including labour, for bungalow, with plaster in and out	18	0	0	„	„
Ditto ditto ditto, for offices ditto ..	15	0	0	„	„
Plastering outside of the veranda off-set wall	3	0	0	„	sq. ft.
Flooring with chunam rough terrace	10	0	0	„	„
Teakwood doors for bungalow	1	1	0	per square foot	
Ditto windows ditto	1	12	0	„	„
Jungle-wood doors and windows	0	12	0	„	„
Roofing for bungalow, with teak trusses, jungle round rafters, and ceiling, complete	65	0	0	per 100 sq. ft.	
Ditto for veranda with posts, putties, sawn, jungle rafters and battens, tiled complete	35	0	0	„	„
Ditto for offices	35	0	0	„	„

Rates at which the Byculla Club Chambers were constructed.

Excavation foundation of main wall	Rs.	1	0	0	per 100 cub. ft.
Filling in foundation with stone and lime	10	0	0	„	„
Plinth of masonry walls	10	0	0	„	„
Stone and lime masonry walls	15	0	0	„	„
Brick partition, exclusive of plaster	30	0	0	„	sq. ft.
Plank partition, deducting doors	0	5	0	„	„
Roof, teak, double tiled, matted round, teak rafters cut teak battens, with teak plank ceiling and cornice	70	0	0	„	„
Ground floor, terraced	12	0	0	„	„
Teak plank floors, with aynee jungle joists	40	0	0	„	„
Teak rails for staircases and gallery	0	8	0	per running foot	
Cornice to gallery	1	0	0	„	„
Cloth ceiling, including teak cornice	12	0	0	per 100 sq. ft.	
Plank ceiling	20	0	0	„	„
Masonry drain, covered, $1\frac{1}{4} \times 1$	1	0	0	per running foot	
Teak posts	2	8	0	per cubic foot	
Chunam plaster, and green and white wash	5	4	0	per 100 sq. ft.	
Teak plank doors, $3 \times 6\frac{1}{2}$	15	0	0	each.	
Ditto windows, with teak bars, $3\frac{1}{2} \times 6$	21	0	0	„	
Fixed venetians to galleries, 8×7	63	0	0	„	

Teak venetianed doors, 8×8	..	..	..	Rs.	80	0	0	each.
Ditto ditto, 4×7	..	..	..	..	42	0	0	„
Teak pannelled doors, $2 \times 6\frac{1}{2}$	..	..	..	..	16	0	0	„
Teak venetianed doors, 3×7	..	..	..	..	30	0	0	„
Bathing-room and pannelled doors, $2\frac{1}{2} \times 6\frac{1}{2}$	..	..	..	..	18	0	0	„
Teak trellis windows, $16\frac{1}{2} \times 3$	..	..	..	..	24	0	0	„
Teak folding venetianed windows, 4×7	..	..	..	..	42	0	0	„
Ditto , ditto ditto, 4×6	..	..	..	..	36	0	0	„
Passage lattice-work	..	..	..	..	0	2	0	per foot.
Green wash to cloth ceiling	..	..	..	..	1	4	0	per 100 sq. ft.
Green paint, two coatings, and varnished	..	..	..	..	6	0	0	„ „

APPENDIX G.

Rough Estimate of the probable Cost of certain Public Improvements urgently and immediately required for the improvement of the Island.

Names of the Streets.	Length in Feet.	Rate per Foot.	Amount.
			<i>Rupees.</i>
Esplanade Cross-road, from Shaik Memon Street to Slaughter House (one side)	1,995	4	7,980
Parell Road, from Jugjeevan Keeka Street to Byculla ..	4,270	7	29,890
Breachcandy Road, from Agiary Road to Portuguese Church Lane	3,860	5	19,300
Road from Portuguese Church to Chowpatty Road ..	2,000	5	10,000
Agiary Road	1,550	6	9,300
Cowasjee Patel Tank Road	990	5	4,950
Duncan Road	3,750	6	22,500
Obelisk Road	1,159	4	4,636
Erskine Road	1,280	4	5,120
Bhooleshwur Road, from Cowasjee Patel Tank to Sun- kersett's garden-house... ..	6,330	8	50,640
Girgaum Portuguese Church Lane	800	4	3,200
Portuguese Church Lane, between Agiary Road and Bhooleshwur Road	750	8	6,000
Bellasis Junction Road	1,650	8	13,200
Erskine Road footpath	1,280	4	5,120
Khetwady Road	3,085	6	18,511
Jail Road	920	8	7,360
Musjeed Bunder Road	1,900	8	15,200
Chinch Bunder Road	2,700	8	21,600
Mazagon Road	2,850	6	17,100
Round the Moombadavee Tank	900	10	9,000
Baboola Tank Road	1,950	6	11,700
Nagdew Street	900	10	9,000
Musjeed Bunder Row	900	10	9,000
Shaik Ally Jungeerkur Street	1,820	8	14,560
Chinch Bunder Sea Road	500	6	3,000
Kolee Bunder Sea Road	73	6	438
Chinch Bunder 1st Row	463	8	3,704
Jamboolwadee Road	260	5	1,300
New Line Street	380	8	3,040
Carried over...	51,265	...	3,36,349

Names of the Streets.	Length in Feet.	Rate per Foot.	Amount. Rupees.
Brought over .	51,265	...	3,36,349
Cross-road from Banian Tree Chowkee to Girgaum Road .	440	5	2,200
Burrows Lane	513	5	2,565
Shaik Abdool Doctor Street	1,490	6	8,940
Cammattee Poora Road	10,376	5	52,880
Hoozra Street	1,014	6	6,264
Funuswadee Lane	1,182	6	7,092
Monghbhat Lane... ..	700	6	4,200
Kakudwadee Lane	380	6	2,280
Road south side of Jail	770	8	6,160
Road north side of Jail	755	6	4,530
Mazagon Road to Dockyard	2,550	6	15,300
Nagdew Row	400	6	2,400
Second Dontarr Row	1,468	8	11,744
Old Caze Street	513	8	4,104
Shamjee Hassajee Street... ..	462	8	3,696
Bhundaree Street... ..	201	8	1,632
Hunuman Road	1,140	6	6,840
Mazagon Lane	1,080	7	7,560
Coppersmith Street, Beebee Jan Row	619	6	3,714
Memonwada Street	1,790	8	14,320
Three cross-streets	450	6	2,700
Road in rear of Mr. Romer's to sea grove	3,920	6	23,520
Poydowney Road	802	6	4,812
Baloo Surung Street	976	6	5,856
Branch Roads	661	8	5,312
Nishandar Oomercarry Row	472	8	3,776
Branchways	419	8	3,592
Dontarr, 1st Row	1,137	6	6,822
Old Nagpada Lane	696	6	4,170
New Hunuman Lane	1,135	6	6,810
Dongree Cooly Sea Road... ..	322	8	2,576
Mahomed Hoossen Kambakur Street	650	7	4,550
Branch road, 2nd Dontarr Row	425	7	2,975
Foogla Street	795	8	6,360
Shamjee Hassajee Street	918	8	7,584
Koombharwada and Bhajee Palla... ..	1,160	8	11,680
Bhajee Pa'la Street	377	8	3,016
Continuation of Khetwady Road. .	1,105	6	6,630
Ditto of Memonwada Street	395	6	2,370
Ditto of the other branch way from Nishandar Oomercarry to Dontarr 2nd Row	396	6	2,370
Ditto of Nishandar Oomercarry Row	915	6	5,490
Caze Syed Street, Bhundarwada, and Jamlee Musjeed Street	994	8	7,952
Khoja Street	1,651	6	9,906
Baba Dubboo Street	1,419	6	8,514
Mukoond Guzerset Street	1,077	6	6,462
Goolam Moideen Subedar Street	987	6	5,922
Koombharwara Road in the New Town	1,488	4	5,952
Carried over..	105,446	...	6,72,449

Names of the Streets.	Length in Feet.	Rate per Foot.	Amount.
			<i>Rupees.</i>
Brought over..	105,446	...	6,72,449
Cross-street connecting Khoja and Shaik Abdool			
Doctor Street	359	5	1,795
Baboola Tank Lane	595	5	2,975
Agiary and Dhunjee Dongeria Streets	1,439	4	5,756
Churney Road	865	4	3,460
Lawrence de Lima Street	1,440	5	7,200
Street from Dhobee's Tank to New Sonapoor Road ..	1,422	5	7,110
Footpaths on each side of the Obelisk Road	1,159	4	4,636
Tank Street	1,546	5	7,730
Shaik Boorun Commodan Street	715	5	3,575
Road from Chinch Bunder Chowkee to Chinch Bunder			
Sea Road	525	5	2,625
Thakoordwar Lane	1,446	4	5,784
Road from Khetwady to Grant Road	823	4	3,292
Chinch Bunder Sea Road to Waree Bunder	2,573	6	15,438
Churney Road near Thakoordwar Road, from Breach-	925	6	5,550
candy Road to Old Distillery Street	282	4	1,128
Candawady Lane	1,900	6	11,400
Road from Old Distillery Street to Sonapoor	413	7	2,891
Cross-road from the Native General Hospital to the			
Sonapoor Drain	375	7	2,625
Khadup Street	825	8	6,600
Dongree Joao Souza Street	958	6	5,748
Hussun Khan Khalifa Row	426	6	2,556
Chinch Bunder 2nd Row... .. .	852	6	5,112
Oomercarry Row	860	8	6,880
Eduljee Cooper Street	408	5	2,040
Total..	1,28,577	...	7,96,355

